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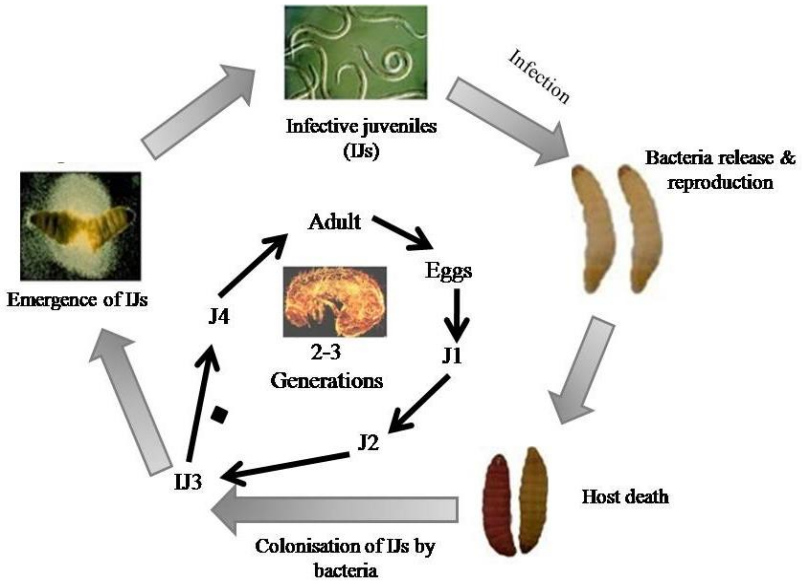
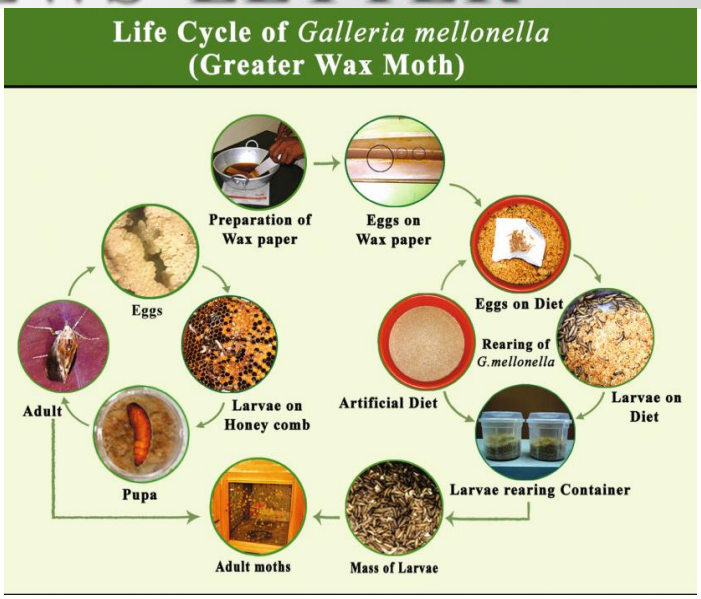
Theme Article





What's Inside

Special Events

From the Director General's Desk

Crop protection is as old as crop cultivation itself. The science of crop protection has immensely contributed to the success of Green Revolution and sustained production of food, fibre, fodder and feed. However, the post green revolution period has left many dark shadows on our agriculture and environment. The intensification of agriculture and increased mono cropping systems increased the pest problems has led to loss of biodiversity and economically important flora and fauna due to chemical intensive crop protection practices. Last four decades of chemical based agriculture led increased pesticide residues in food, water, soil and environment. Due to imbalance of ecological equilibrium, resurgence of minor pests and pathogens has become major concern of present day agriculture. Higher pesticides residues are showing ill and irreversible health effects on human and animals.

The present agriculture is concentrating towards food safety in addition to food security. Pest management is shifting towards eco-friendly approaches. Instead of chemical practice alone, integrated management practices which involve combination of biological, physical, cultural and chemical are emphasised. This practice ensures sustained production and productivity in Indian agriculture.

Biological pest management is need of the hour and identification of potential bio-control agents is major objective of research for many plant protection researchers. National Institute of Plant Health Management (NIPHM) has pioneered in developing bio-control agents for both insect pests and diseases management. It has established its strength of research results both regionally and nationally. Among the microbial bio-control agents used for insect pest management, fungi, bacteria and viruses are common. However, nematodes are never tried and tested for insect pest management commercially in India. Nematodes that parasitize insects, also known as entomopathogenic nematodes (EPNs), have the wide potential to use as candidate bio-control agents for direct application and also to include in integrated pest management practices.

फसल संरक्षण उतना ही पुराना है जितना कि फसल उगाना । फसल सुरक्षा के विज्ञान ने हरित क्रांति की सफलता और भोजन, फाइबर, चारा और चारे के निरंतर उत्पादन में अत्यधिक योगदान दिया है । जबकि, हरित क्रांति के बाद के समय ने हमारे कृषि एवं पर्यावरण पर कई काली छायाएं छोड़ी हैं । कृषि की गहनता और बढ़ी हुई मोनो क्रॉपिंग प्रणालियों ने पीड़क एवं रोगजनकों को बढ़ाया और रासायनिक गहन फसल संरक्षण प्रथाओं के कारण जैव विविधता और आर्थिक रूप से महत्वपूर्ण वनस्पतियों और जीवों की हानि हुई है । रासायनिक आधारित कृषि के पिछले चार दशकों में भोजन, पानी, मिट्टी और पर्यावरण में पीड़कनाशी अवशेषों में वृद्धि हुई है । पारिस्थितिक संतुलन के असंतुलन के कारण, मामूली पीड़क और रोगजनकों का पुनरुत्थान वर्तमान कृषि की प्रमुख चिंता बन गया है । उच्च पीड़कनाशी अवशेष का प्रभाव मानव और जानवरों के स्वास्थ्य पर अपरिवर्तनीय प्रभाव पड़ रहा हैं ।

वर्तमान कृषि खाद्य सुरक्षा के साथसाथ खाद्य सुरक्षा पर ध्यान केंद्रित - कर रही है । पीड़क प्रबंधन पर्यावरण के अनुकूल दृष्टिकोण अपनाने की ओर बढ़ रहा है । रासायनिक प्रयोग के बजाय, एकीकृत प्रबंधन प्रथाओं पर जोर दिया जाता है जिसमें जैविक, भौतिक, कल्चर और रासायनिक संयोजन शामिल होते हैं । यह प्रयोग भारतीय कृषि में निरंतर उत्पादन और उत्पादकता सुनिश्चित करता है ।

जैविक पीड़क प्रबंधन समय की आवश्यकता है और कई पौध संरक्षण शोधकर्ताओं के लिए संभावित जैवनियंत्रण कारकों की पहचान करना - ति स्वास्थ्य प्रबंधन अनुसंधान का प्रमुख उद्देश्य है । राष्ट्रीय वनस्प कीट पीड़क एवं रोग प्रबंधन दोनों के लिए (एनआईपीएचएम) संस्थान नियंत्-जैवरण कारक विकसित करने में अग्रणी है । इसने क्षेत्रीय और राष्ट्रीय स्तर पर अनुसंधान परिणामों की अपनी मज़बूती स्थापित की है । पीड़क प्रबंधन के लिए उपयोग किए जाने वाले माइक्रोबियल जैव-नियंत्रण कारकों में, कवक, बैक्टीरिया और वायरस साधारण हैं । जबकि, सूत्रकृमि को कभी भी भारत में कीट पीड़क प्रबंधन के लिए व्यावसायिक रूप से आजमाया एवं परखा नहीं गया है । सूत्रकृमि जो पीड़कों को परजीवी बनाते हैं, जिन्हें एंटोमोपैथोजेनिक नेमाटोड के रूप में (ईपीएन) भी जाना जाता है, प्रत्यक्ष इस्तेमाल के लिए प्रत्याशी जैवनियंत्रण - कारकों के रूप में उपयोग करने और एकीकृत पीड़क प्रबंधन प्रथाओं में शामिल करने की व्यापक क्षमता है ।

एनआईपीएचएम ने स्टीनरनेमेटिडे और हेटरोरहैबडिटिडे परिवारों से ईपीएन की अत्यधिक संभावित स्टीनरनेमा और हेटरोरहैबडाइटिस

NIPHM has identified highly potential *Steinernema* and *Heterorhabditis* species of EPNs from *Steinernematidae* and *Heterorhabditidae* families. The EPNs are tested *in vitro* and *in vivo* against many economically important insect pests and found very effective. Their ability to kill the insects such as white grub, diamond back moth, pod borer (*Helicoverpa),* cut worm, (*Spodoptera),* leaf webber and semilooper is well documented and confirmed. Their field demonstration against sugarcane white grub in Maharashtra has proved their ability beyond doubt. They confirmed most significant bio-control agent against root grub compared to chemical practices and other bio-control agents. Many farmers, agricultural officers and extension officials from different state departments are regularly getting trained on production and use of EPNs against sugarcane pests at NIPHM. The impressive results have become talk of the towns in sugarcane region of Maharashtra through mass media. Over the years NIPHM has trained officers and farmers about use of nematodes against insect pests.

EPNs are safe to environment, humans, animals and other microbial agents, easy to use, apply and store. They are exempted from registration in USA and many other countries and used widely. The absence of suitable and commercially viable EPNs mass production and formulation technology in India has been overcome by National Institute of Plant Health Management. NIPHM has been instrumental in developing cutting edge technologies in the field of plant health management through biological control agents. The technologies are protected by patent rights. In order to bring the Entomopathogenic nematodes on main plat form of biological pest management, NIPHM has developed technology with respect to mass production and formulation of Entomopathogenic nematodes. This is highly potential and viable technology. Technology was invented by NIPHM and a patent application no. 3948/CHE/2014 Journal No: 34/14 was filed by the institute on August 11, 2014. This is the first of its kind in India for which the patent has been granted on December 30, 2021 with Patent No. 385637

In the interest of farming community, NIPHM is offering the technologies under Public Private Partnership mutual agreements for large scale utilization. There is a need to reform the plant protection practices across the country. This is the right time to realize the importance of EPNs and consider their use in management of insect pests. NIPHM would be happy to serve and support all the interested individuals and institutes in this technology.

प्रजातियों की पहचान की है । ईपीएन का इन विट्रो और इन विवो में कई आर्थिक रूप से महत्वपूर्ण पीड़क के खिलाफ परीक्षण किया जाता है और यह बहुत प्रभावी पाया जाता है । व्हाइट ग्रब, डायमंड बैक मॉथ, पॉड बोरर (हेलिकोवर्पा), कट वर्म, (स्पोडोप्टेरा(, लीफ वेबर और सेमीलूपर जैसे पीड़कों को मारने की उनकी क्षमता अच्छी तरह से प्रलेखित और पुष्टि की गई है । महाराष्ट्र में गन्ने की सफेद पीड़क के खिलाफ उनके क्षेत्र प्रदर्शन ने उनकी क्षमता को संदेह से परे साबित कर दिया है । उन्होंने रासायनिक प्रथाओं और अन्य जैवनियंत्रण कारकों की - न-तुलना में रूट ग्रब के खिलाफ सबसे महत्वपूर्ण जैवियंत्रण कारकों की पुष्टि की है । विभिन्न राज्य विभागों के कई किसान, कृषि अधिकारी और विस्तार अधिकारी एनआईपीएचएम में गन्ने के कारकों को रोकने हेतु ईपीएन के उत्पादन और उपयोग पर नियमित रूप से प्रशिक्षित हो रहे हैं । मास मीडिया के माध्यम से महाराष्ट्र के गन्ना क्षेत्र के कस्बों में प्रभावशाली परिणाम चर्चा का विषय बन गए हैं । वर्षों से एनआईपीएचएम ने किसानों एवं अधिकारियों को पीड़कों के लिए सूत्रकृमि के उपयोग के बारे में प्रशिक्षित किया है ।

ईपीएन पर्यावरण, मनुष्यों, जानवरों एवं अन्य माइक्रोबियल एजेंटों के लिए सुरक्षित हैं, उपयोग करने, लगाने और स्टोर करने में आसान हैं । उन्हें यूएसए और कई अन्य देशों में पंजीकरण से छूट दी गई है और व्यापक रूप से उपयोग किया जाता है । भारत में उपयुक्त और व्यावसायिक रूप से व्यवहार्य ईपीएन के बड़े पैमाने पर उत्पादन और सूत्रीकरण तकनीक की कमी को एनआईपीएचएम द्वारा दूर किया गया । राष्ट्रीय वनस्पित स्वास्थ्य प्रबंधन संस्थान जैविक (एनआईपीएचएम) त स्वास्थ्य प्रबंधन के क्षेत्र में नियंत्रण एजेंटों के माध्यम से वनस्पि अत्याधुनिक तकनीकों के विकास में सहायक रहा है । प्रौद्योगिकियों को पेटेंट अधिकारो द्वारा संरक्षित किया जाता है । जैविक पीड़क प्रबंधन के मुख्य मंच पर कीटरोगजनक सूत्रकृमियों को लाने के लिए, एनआईपीएचएम ने बड़े पैमाने पर उत्पादन और पीड़क रोगजनक सूत्रकृमियों के निर्माण के संबंध में नवीनतम अत्याधुनिक तकनीक विकसित की है । यह अत्यधिक क्षमता और व्यवहार्य तकनीक है । प्रौद्योगिकी का आविष्कार एनआईपीएचएम द्वारा किया गया था और एक पेटेंट आवेदन संख्या .3948/सीएचई/2014 जर्नल नंबर :34/14 संस्थान द्वारा अगस्त 11, को दर्ज किया गया था । जो भारत 2014 के स 385637 में इस तरह का पहला है जिसके लिए पेटेंट संख्याथ दिसंबर 30, 2021 को पेटेंट प्रदान किया गया है ।

एनआईपीएचएम कृषक समुदाय के हित में बड़े पैमाने पर इस्तेमाल हेतु सार्वजनिक निजी भागीदारी आपसी समझौतों के तहत प्रौद्योगिकियों की शुरूवात कर रहा है । यहाँ देश भर में पौध संरक्षण विधियों में सुधार की आवश्यकता है । ईपीएन के महत्व को समझने और पीड़कों के प्रबंधन में उनके उपयोग पर विचार करने का यह सही समय है । एनआईपीएचएम के इस तकनीक में रुचि रखने वाले सभी व्यक्तियों एवं संस्थानों की सेवा और समर्थन करने में खुशी होगी ।

(डॉ. सागर हनुमान सिंह, भा.डा.से.)
महानिदेशक

Entomopathogenic Nematodes (EPNs): A Green Strategy for Management of Insect-Pests of Crops

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Introduction:

Biological pest management is need of the hour and identification of potential bio-control agents is major objective of research for many plant protection researchers. National Institute of Plant Health Management (NIPHM) has pioneered in developing bio-control agents for both insect pests and diseases management. It has established its strength of research results both regionally and nationally. Among the microbial bio-control agents used for insect pest management, fungi, bacteria and viruses are common. However, nematodes are never tried and tested for insect pest management commercially in India. Nematodes that parasitize insects, also known as entomopathogenic nematodes (EPNs), have the wide potential to use as candidate bio-control agents for direct application and also to include in integrated pest management practices.

The interest in the use of entomopathogenic nematodes as biological pest control agents has increased exponentially over the past decades. The entomopathogenic nematodes have proven successful and are now commercially mass-produced in many countries to treat pest problems in agriculture, horticulture. The ease of mass production and exemption from registration requirements are the two major reasons for early interest in the commercial developments of entomopathogenic nematodes

Entomopathogenic Nematodes (EPNs) are naturally occurring, tiny, microscopic worms, barely visible to the naked eye. As the name suggests they are insect killing (entomopathogenic). They are natural predators of the crop insect pests. They are proven safe and most effective way of controlling various insect pests without harming the environment**.**

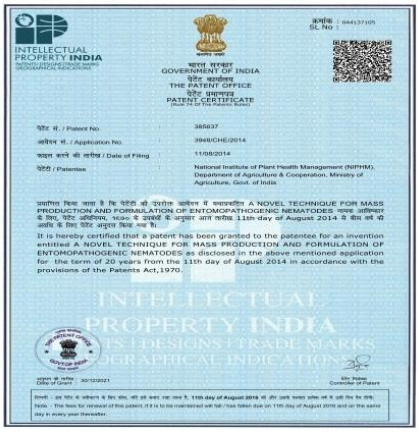
Entomopathogenic nematodes of families Steinernematidae and Heterorhabditidae are unique in their action and potential. They are considered as one of the most suitable entomopathogens in managing wide variety of insect pests particularly soil inhabiting ones. The uniqueness stems out from their symbiotic association with entomopathogenic bacteria, ease of mass production, storage and application. Due their safety to non-target organisms and the environment, they are even exempted from Environment Protection Act in many countries.

The NIPHM has identified highly potential Steinernema and Heterorhabditis species of EPNs from *Steinernematidae* and *Heterorhabditidae* families. The EPNs are tested *in vitro* and *in vivo* against many economically important insect pests and found very effective. Their ability to kill the insects such as white grub, diamond back moth, pod borer (*Helicoverpa)*, cut worm, (*Spodoptera)*, leaf webber and semilooper is well documented and confirmed. Their field demonstration against sugarcane white grub in Maharashtra has proved their ability beyond doubt. They confirmed most significant bio-control agent against root grub compared to chemical practices and other bio-control agents. Many farmers, agricultural officers and extension officials from different state departments are regularly getting trained on production and use of EPNs against sugarcane pests at NIPHM. The impressive results have become talk of the towns in sugarcane region of Maharashtra through mass media. Over the years this technology development more than 1500 farmers and 500 officers are trained.

The absence of suitable and commercially viable EPNs mass production and formulation technology in India was overcome by NIPHM. These highly potential and viable technology has got patent grant. In the interest of farming community the NIPHM is offering the technologies under Public Private Partnership mutual agreements for large scale utilization. There is a need to reform the plant protection practices across the country. This is the right time to realize the importance of EPNs and consider their use in management of insect pests. NIPHM would be happy to serve and support all the interested individuals and institutes in this technology.

National Institute of Plant Health Management (NIPHM) has been instrumental in developing cutting edge technologies in the field of plant health management through biological control agents. The technologies are protected by patent rights. The institute offers rights of these technologies to interested public and private firms on agreement and competitive royalty basis. In order to bring the Entomopathogenic Nematodes on main plat form of biological pest management, NIPHM has developed latest cutting edge technology with respect to mass production and formulation of Entomopathogenic Nematodes. Technology was invented by NIPHM and a **patent application no. 3948/CHE/2014 Journal No: 34/14 was filed by the institute on August 11, 2014, which is the first of its kind in India for which the patent has been granted on December 30, 2021 with Patent No. 385637**

EPN technology sharing with Private Company through Agreement



Patent certificate

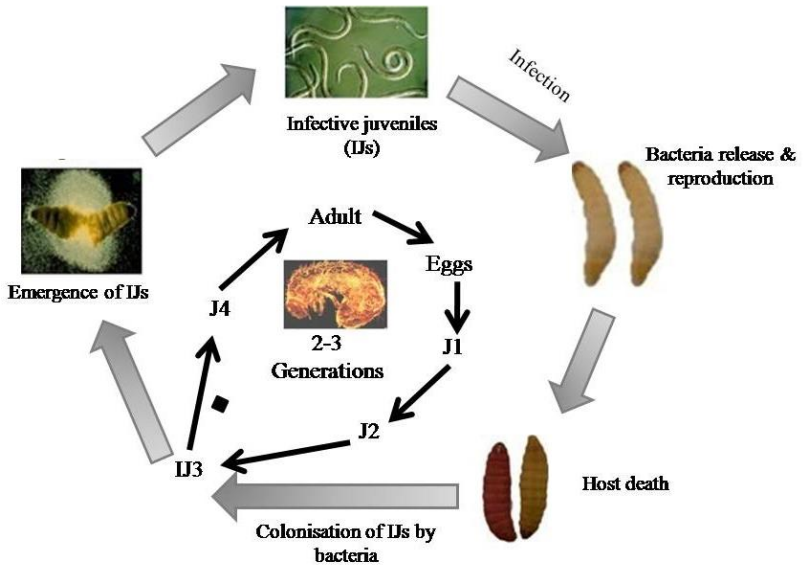
Salient features of patented technology for mass production of Entomopathogenic Nematodes

- Can harvest pure culture of EPN compared to White trap method
- Low cost and uses local resources and easy to adopt (cost reduction by 80%)
- Without any sophisticated equipment's at room temperature EPN can be multiplied on standard host using new technology
- Can harvest more number of IJs of EPN (Increased yield of EPN)
- Effective, cheap and practical method for EPN mass production
- Can be promoted as rural home based cottage industry among rural women
- Upgradable to cottage industry level without much investment
- The new method accommodates more number of larvae
- No mortality of EPN
- EPNs can be stored under shade and not exposed to direct light

Life Cycle of Insect-Parasitic Nematodes/EPNs: EPNs complete most of their life cycle in insects with an exception of infective juveniles, the only free-living stage found in soil.

1. Infective juvenile nematodes in soil enter insect body through natural openings.
2. Nematodes enter insect body cavity.
3. Nematodes develop into adults.
4. Nematodes reproduce and produce offspring.

5. Infective juvenile nematodes leave the dead insect and seek a new insect host.



◆ : IJ3 will repeat the cycles to mass multiply till the cadavers are exhausted & then start emerging out.

Mass production techniques for entomopathogenic nematodes

Facilities available with trained nematologist (Infrastructure/Equipment's): NIPHM has established with the state of the art laboratory facilities with a designated scientists specialized in nematology and other infrastructures required for training, research and extension in the nematology science.

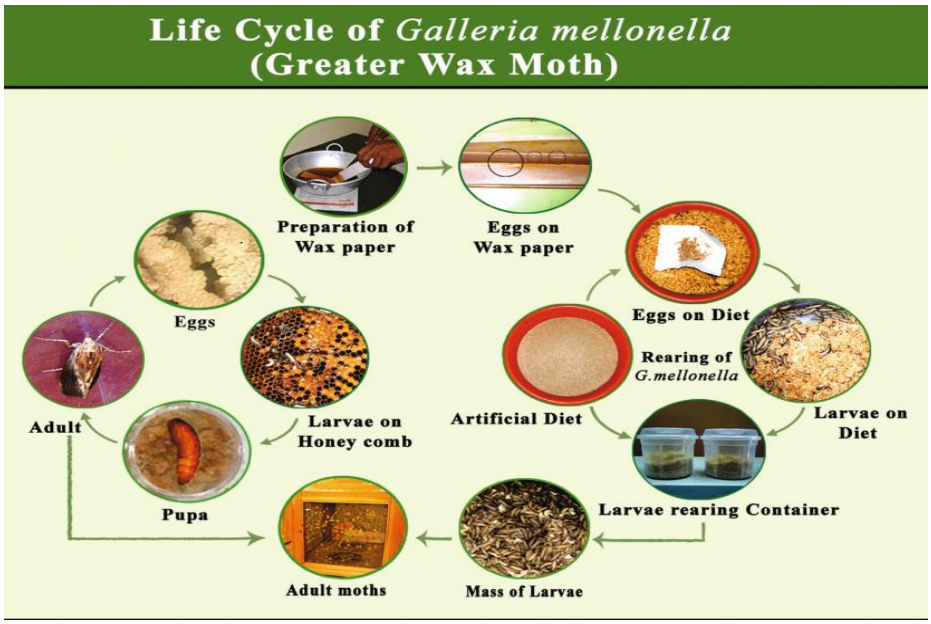
Officers training on EPN

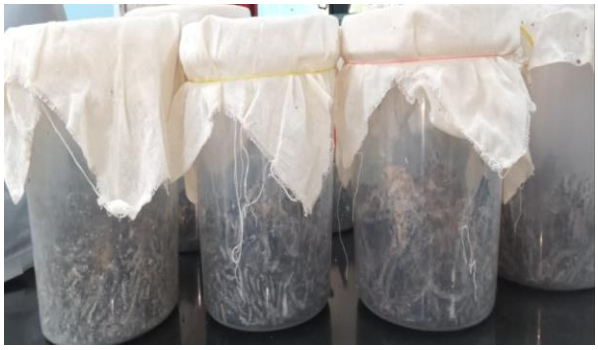
Well furnished lab

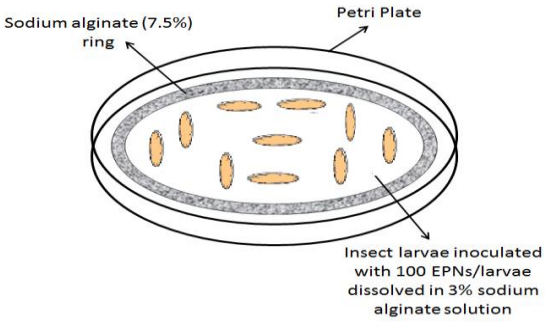
Technology available: NIPHM has developed latest cutting edge technology with respect to mass production and formulation of Entomopathogenic nematodes. Technology was filed for patent grant application no. 3948/CHE/2014 Journal No: 34/14 on August 11, 2014. Which is the first of its kind in India for which **the patent has been granted on December 30, 2021 with Patent No. 385637.** Technologies are being transferred to interested stake holders for their large scale adoption and popularization. Under this domain, participation of public and private agencies is being promoted and revenue was generated by transfer of technologies developed through agreements. Trainings were also

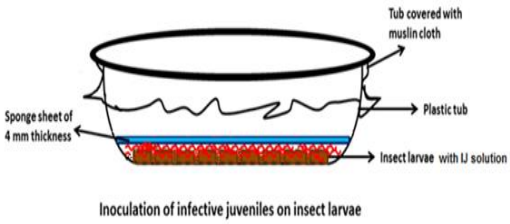
provided on up-scaling of technologies and their field applications to interested rural youth to create rural employment opportunities.

Rearing of Host (greater wax moth (*Galleria melonella*)



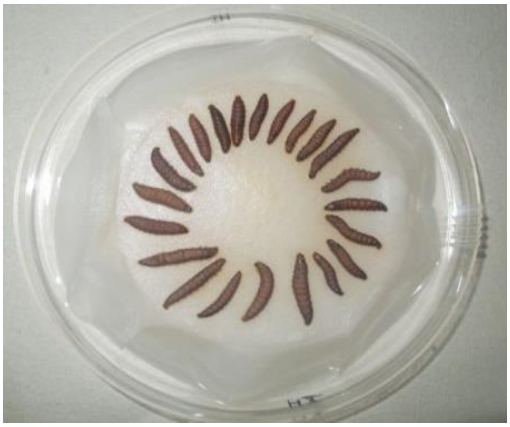






Inoculation of infective juveniles on insect larvae

Mass production of EPNs:

Mass production of EPN

Entomopathogenic nematodes are currently mass-produced by either *in vivo* or *in vitro* (solid and liquid culture).Methods *In vivo* production system is based on the White trap (White, 1929), which take advantage of the IJ's natural migration away from host cadaver upon emergence. The most common insect host used for *in vivo* production is the last instar of the greater wax moth (*Galleria melonella*), because of its high susceptibility to most nematodes, ease in rearing, wide availability and ability to produce high yields. Insect hosts are inoculated on a dish or tray lined with absorbent paper. After approximately 2-5 days, infected insects are transferred to the White traps.

In vitro culturing of EPNs is based on introducing nematodes to a pure culture of their symbiont in a nutritive medium (contains peptone, yeast extract, eggs, soy flour and lard). A liquid medium is mixed with foam, autoclaved, and then inoculated with bacteria followed by the nematodes. Nematodes are then harvested within 2-5 weeks by placing the foam onto sieves immersed in water.

Formulation of EPNs:

Nematodes can be stored and formulated in different ways including the use of polyurethane sponge, water-dispersible granules, vermiculite, alginate gels, micronized vermiculite, and an aqueous suspension of nematodes and baits. Bait formulations and insect host cadavers can enhance EPN persistence and reduce the quantity of nematodes required per

unit area. Formulated EPNs can be stored for 2 to 7 months depending on the nematode species and storage media and conditions.

Application of EPNs: can be applied through the following methods

- Foliar application
- Soil application
- Broadcasting
- Spray
- Drip Irrigation
- Drench

Optimum moisture (30% field capacity) temperature (25-30 ℃) soil type (lighter soils) should be checked

Dosages: Use of 1billion nematodes per acre as soil application at planting time is found to be highly effective in managing root grub in sugarcane, 2-4 infected cadavers of *Galleria mellonella* per plant is optimum

Limitations of existing techniques & formulations

- The in vivo multiplication method viz. White trap method (1927) is utilized in laboratories, glass house studies etc.
- Though the technology is simple the short comings are
- It requires specialized training.
- Requirement of huge space and large quantity of glass wares for mass production.
- Requirement of close monitoring for ensuring infection of the host,

Popularizing EPN as potential bio- agents in different crops:

In spite of the significant benefit of EPN in managing insect pests, particularly soil borne insects, utilization of EPN in our country is very low. There is a need for building awareness on role of EPN as biological control agents among the extension functionaries and farmers. NIPHM has started to popularize the use of EPN with special focus on management of root grub in sugarcane. Root grub is major pest which feeds on sugarcane roots. It is damaging thousands of sugarcane fields in Maharashtra NIPHM steps to popularize EPN as an alternative strategy for root grub management in sugarcane. It opened a new chapter in management of root grub this area. Initially EPNs culture was supplied to sugarcane belt of Sangli & Kolhapur districts. Best practices of EPNs application were demonstrated. Farmers were also trained in EPN application methodology for root grub management. NIPHM is with the assistance of district agriculture officer successfully demonstrated in farmers' fields the way forward in mitigating the menace caused by root grub with EPN. Based on the success in management of root grub with EPN, farmer's co-operatives in Sangli & Kolhapur districts have established a laboratory for in vivo mass production of EPN with technical support of NIPHM.

Success stories of use of entomopathogenic nemaodes (EPN):

Mr.Rajendra Dattatray Dashvant, village Mangle, Tahsil-Shirala District-Sangli, Maharashtra is sugarcane grower. He was also facing root grub problem, he tried chemicals control measures but could not succeed in minimizing the crop losses. Root grub devastated entire sugar industry in Sangli and Kolhapur region. Farmers lost their crop up to 80-100 per cent and Mr. Rajendra was one of them. The ATMA, Sangali used to arrange interstate farmers training every year. He had an opportunity in this training during 2016 and undergone three days training at NIPHM on use of Entomopathogenic nematodes for the management of root grub in sugarcane (EPNs). While leaving NIPHM he carried EPN cultures for field trail. After returning home he applied the EPNs culture on 5 gunta area and was kept every day observation. He observed the paralyzing of rootgrub in a few days after application. He called NIPHM nematologist and explained his experience. He visited NIPHM once again within 15 days and collected more EPN culture to apply in more area at his field. The story of his successful control of root grub started spreading around his nebiouring farmers. He almost eliminated root grub problem in his total 5 acres of sugarcane cultivation. He started educating more farmers in and around his field about use of EPNs. The state extension functionaries visited his plot along with sugar factory extension officers and found significant control of root grub. The Department of Agriculture invited NIPHM nematologist to educate more farmers on use of EPNs against root grub. NIPHM has provided training programme on use of EPN for the biological management of root grub in sugarcane.



Management of root grub by using EPN by farmers of Maharashtra

Insect pests in field crops are the primary concerns of farmers. Many commercial crops suffer from insect damages up to 100%. Root grub in sugarcane is the similar kind of pest which feeds on sugarcane roots. It was damaging thousands of sugarcane fields in Maharashtra. All the available chemical and biological control measures failed to arrest the spread of insect damage. Farmers and sugar mills were depressed due to huge damage caused by this root feeding insect. They had lost their hopes of getting any returns.

The EPNs technologies developed at NIPHM came as a life saver to suffering sugarcane. It opened a new chapter in management of root grub this area. Initially EPNs culture was supplied to sugarcane belt of Sangali, Kolhapur districts, and best practices of EPNs application were demonstrated. Within short time, the newly introduced bio-control agent reduced the pest population very drastically. The smiles returned on drowsy cane growers was proof of ability of this technology developed at NIPHM. Who is engaged with development and field extension of this technology was invited by Agriculture Department, farmers' organizations and cane growers groups in Maharashtra. NIPHM is training to number of farmers and cane growers on EPN technology in root grub management. The entire sugar bowl of

Maharashtra is now looking to adopt this technology, NIPHM is supplying EPNs culture for many district agriculture officials and they are successfully demonstrating in farmers' fields to show the way forward in mitigating the menace caused by root grub. The success of EPNs from NIPHM was very widely covered in mass media and a few clippings of newspapers of Maharashtra are the feedback to the height of success the technology has achieved.

Some of the list of farmers used EPN against white grubs in sugarcane is mentioned below

1.Mr.Belsare Shridhar Sudhakar Agril. Asstt. Taluka Agril. Office Shrirampur.Dist. Ahmadnagar, MS, 4.Mr. Avinash N.Salunke, B-13, Sanskruti Appt, Opp SBI Shrirampur, Dist Ahmednagar Maharashtra	2.Mr.Rajendra Dattatray Dashvant, At Post Mangle, Tahsil-Shirala, District-Sangli, Maharashtra 5.Mr.Sunil Hindvarao Patil, A/P.Wakare, Taluka Karuveer, Dist. Kolhapur Maharashtra	3.Mr. Pradip P. Bilhore A/P.Sindlched Raja, TQ-Sindlched Raja, Dist Buldhana, Maharashtra

News clippings of success stories of Use of EPN against Root grub in sugarcane in Maharashtra

EPN Based Bio-control of White Grub in Sugarcane

One day agriculture workshop on '**EPN Based Bio-control of White Grub in Sugarcane**' was organized at VSI, Pune on 27th May, 2017. Dr. Sunanda Patil, Nematologist, NIPHM, Hyderabad was present as the chief guest for this workshop. Total 73 participants working as Agricultural Officers and Cane Development Officers from 24 sugar mills as well as Agricultural Graduates and farmers of Maharashtra State attended the workshop. Mrs. Kranti Nigade welcomed all participants and staff of Agriculture division.

In his introductory speech, Dr. DB Phonde, Sr. Scientist & Head, Soil Science, Agril. Microbiology and Agronomy section explained severity of white grubs attack and the importance of EPN (Entomopathogenic Nematode) and EPF (Entomopathogenic Fungi) in controlling white grubs in sugarcane especially in Sangli, Kolhapur Districts and in some part of central Maharashtra. The use of chemical pesticides has caused detrimental effect on beneficial soil flora including beneficial nematodes. The insufficient organic matter also affects the soil flora. Besides the loss of beneficial soil flora, chemical pesticides causes water and atmospheric pollution that poses threat to human and ecosystem.

Mrs. Rutuja R. More, Scientist & Head, Agriculture Microbiology section briefed the research performed in recent years in laboratory and at field levels. The section has developed EPF consortium of *Beauveria bassiana, Verticillium lecanii, Metarrhizium anisopliae* and *Bacillus thuringensis* (BVM) a liquid bio-pesticide for controlling white grubs. Mr. RG Yadav, Scientist & Head, Entomology section made presentation on the life cycle of *Holotrachia serrata* and *Leucopholis lepidophora* (White grub), nature of damage and control measures. Dr. Sunanda Patil explained the importance of EPN for controlling white grubs, its mass production, formulation and field delivery methods.

Mrs. Sudha Ghodke and Mrs. Nigade presented success stories on EPF developed by VSI at sugar mills and EPN based bio-control of white grub in sugarcane and informed regarding importance of EPF and EPN for controlling white grubs. Mr. SN Patil, CDO, Rajarambapu SSK, Kolhapur and Mr. Dilip Jadhav, CDO, Kranti Sugar SSK, Sangli briefed their experiences in area of operation of sugar mills regarding white grub attack and control measures used.

In interaction programme, the participants interacted with Dr. Sunanda Patil, Dr. DB Phonde and Mrs. More regarding use of EPN for controlling white grubs. Mr. Shivajirao Deshmukh, Director General, VSI interacted with participants on various problems and stressed on the need of more participation from sugar mills. The event was concluded with a vote of thanks with following recommendations.

- Maintenance of EPF and EPN along with organic fertilizers in soil is mandatory to control pests in sugarcane.
- For controlling white grubs, application of liquid EPF@2 lit/acre in 200 lit of water by drenching is recommended.

सकाळ

सांगली । गुरुवार, ७ नोव्हेंबर २०१३ । किंमत ₹ चार

सकाळ सांगली शहर–जिल्हा

'हुमणी'साठी 'ईपीएन'सूत्रकृमीचा यशस्वी प्रयोग

कोल्हापूर पुण्यनगरी चौफेर

हुमणीची खोड मोडणार!

सूत्रकृमीने हुमणीचे नियंत्रण शक्य

बुरशीपासून बनतात सूत्रकृमी

शेती-शेतकरी

शिराळ्यात हुमणी नियंत्रण अभियान सुरू

They have also been highly effective against fungus gnats (Sciaridae) in mushroom houses. Cutworms and armyworms (Noctuidae) in vegetables and turfgrass. White grubs (Scarabaeidae) in vegetables and sugarcane. Black vine weevil, Otiorhynchus sulcatus (Fabricius) (Coleoptera: Curculionidae), in greenhouse and nursery stock, Other insects *Tribolium casteinum, Plutella xylostella, Helicoverpa armigera and Pieris brassicae*.

Conclusion:

There is a need for popularizing the use of EPN for insect pest management both soil borne and foliar insect pests. Utilization of EPN by the farmers can be increased only when production of EPN is feseable at farm level besides reduction in cost of production for commercial operators. The agricultural extension officers should be imported with knowledge on the role of EPN in insect pest management. Reliance on EPN for management of soil borne insect pests will also result in significant reduction of chemical pesticides and ensure that soil health of agroecosystems is protected. NIPHM is committed to build the capasity of different stake holders to popularize mass production of EPN and their utilization as an alternative to excessive reliance on chemical pesticides, the usage of which is determental to soil health.

EPN-Cafetaria-Ultimate goal

- EPN offer a sustainable and long –lasting ecologically-safe solution to white grub and other soil borne insect pests
- Startups for unemployed youth
- Scale-up production systems: Fermentation system
- Time of application: At the incidence of pest

Around the World

Entomopathogenic nematodes of families *Steinernematidae* and *Heterorhabditidae* are unique in their action and potential. They are considered as one of the most suitable entomopathogens in managing wide variety of insect pests particularly soil inhabiting ones. The uniqueness stems out from their symbiotic association with entomopathogenic bacteria, ease of mass production, storage and application. Due their safety to non-target organisms and the environment, they are even exempted from Environment Protection Act in many countries. Indian research on EPNs dates back to 1960s with use of DD-136 (a commercial product of Steinernema carpocapsae) against several lepidoteran pests. Heterorhabditis indica was first to be isolated from Indian soils during late 1980s. Later, several new species of Steinernema are isolated from different parts of the country. However, unlike in European and American countries, local isolates have never been exploited to the fullest extent in India. One possible reason might be lack of awareness and expertise in handling the EPNs. In fact, handling EPNs is not a difficult task at all. With fundamental knowledge of nematodes and insects, any scientist can isolate, culture, store and even evaluate against target insects with ease. In order to promote use of EPNs against insect pests in Agri/Horti crops NIPHM has developed a unique technology and protected with patent grant.

Training Programs

Plant BioSecurity Division

The Plant Biosecurity Division has organized following training programmes during the months of **January-March, 2023**.

CAPACITY BUILDING PROGRAMMES:

S. No.	Name of The Programme	Duration	Date	
			From	To
	Plant Biosecurity Division (PBD)			
1.	Phytosanitary Inspection Training for Phytosanitary Service Agency and Phytosanitary Service Provider for Inspection of Plants/ Plant Products & other Regulated Articles in Export	30 Days	02.01.2023	31.01.2023
2.	Fruit fly surveillance and Management	5 Days	16.01.2023	20.01.2023
3.	Detection and Diagnosis of Pests, Pest Risk Analysis, Pest Surveillance and Phytosanitary Treatments for Uzbekistan Officials-	12 Days	19.01.2023	30.01.2023
4.	ITEC – MEA training on "The Biosecurity Continuum and Trade: Tools for Pre - Border, Border and Post - Border Biosecurity" -	14 Days	01.02.2023	14.02.2023
5.	SPS Measures, Good Agricultural Practices and Food Safety at KVK, Kaimur, Bihar	1Day	26.12.2022	26.12.2022
6.	SPS Measures, Good Agricultural Practices and Food Safety at KVK, Arrah, Bihar	1Day	28.12.2022	28.12.2022
7.	SPS Measures, Good Agricultural Practices and Food Safety at KVK, Arurangabad, Bihar	1Day	29.12.2022	29.12.2022
8.	SPS Measures, Good Agricultural Practices and Food Safety at KVK, Barabanki, Uttar Pradesh for FPOs (**Off Campus**)	1Day	15.02.2023	15.02.2023
9.	SPS Measures, Good Agricultural Practices and Food Safety at KVK, Basti, Uttar Pradesh for FPOs (**Off Campus**)	1Day	16.02.2023	16.02.2023

S. No.	Name of The Programme	Duration	Date	
			From	To
	Plant Biosecurity Division (PBD)			
10.	SPS Measures, Good Agricultural Practices and Food Safety at KVK, Gorakhpur, Uttar Pradesh for FPOs (**Off Campus**)	1Day	17.02.2023	17.02.2023
11.	Fumigation as a Phytosanitary Treatment (MBr and ALP Fumigation	15 Days	27.02.2023	13.03.2023
12.	e-ITEC MEA programme on "Plant Pest Surveillance"	5 Days	13.03.2023	17.03.2023
13.	e-ITEC MEA programme on "Fundamentals of Pest Risk Analysis	5 Days	27.03.2023	31.03.2023
PBD- Farmers Programme				
14.	Export potential and export procedure for Agricultural commodities" to the FPOs of Nagaon District, Assam	1Day	10.01.2023	10.01.2023
15.	Plant quarantine procedures for Export and import of plants and plant products for Assam	1Day	11.01.2023	11.01.2023
16.	Plant quarantine procedures for Export and import of plants and plant products for Assam	1Day	21.01.2023	21.01.2023
Vertebrate Pest Management (VPM)				
17.	Certificate course on Urban Integrated Pest Management- Payment Programme	15 Day	01.02.2023	15.02.2023
18.	Risk assessment of vertebrate Pest Management	10 Day	08.02.2023	17.02.2023

A. DETAILS OF TRAINING PROGRAMMES (Govt. Officials & Private sector)

1. **Phytosanitary Inspection Training for Phytosanitary Service Agency and Phytosanitary Service Provider for Inspection of Plants/ Plant Products & other Regulated Articles in Export: NSPM 23** standard provided provision of outsourcing phytosanitary activities in India as per International Plant Protection Convention (IPPC) except for the issuance of phytosanitary certificates. To outsource the phytosanitary activities, non-governmental personnel may be accredited by the NPPO to carry out specified certification functions such as inspection of Plants/ Plant Products & other Regulated Articles in Export. NIPHM has organized, one month (30 Days) training from 2nd -31st January, 2023.Total 12 attended the programme.


Practical sessions

Irradiation Unit visit


Demonstrations of Irradiation Treatment

Visit to PQS, Hyderabad

2. **Fruit fly Surveillance and Management:** The programme was organized from 16th -20th January, 2023 and total 68 officers from different states and departments have attended the programme on virtual mode.

3. **Detection and Diagnosis of Pests, Pest Risk Analysis, Pest Surveillance and Phytosanitary Treatments for Uzbekistan Officers-*International Programme*:** The programme is exclusively conducted for Uzbekistan Officers on various aspects related to Plant Biosecurity from 19th- 30th January. Interactive sessions along with exposure visits were planned and executed during the training period. Total 32 participants have attended the programme.


Inauguration of the programme

Practical Sessions

Visit to PQS, Shamshabad

4. **The Biosecurity Continuum and Trade: Tools for Pre - Border, Border and Post - Border Biosecurity:** Realizing the importance of plant biosecurity, NIPHM in partnership of Indian Technical and Economic Cooperation (ITEC) under the Ministry of External Affairs (MEA), Govt. of India organized an exclusive International training program from 1st to 14th February, 2023. In this program, eleven officers from different countries viz., Eritrea, Ethiopia, Sri Lanka, Sudan, Tanzania, South Africa and Maldives In this program, eleven officials from seven countries viz., Eritrea, Ethiopia, Sri Lanka, Sudan, Tanzania, South Africa and Maldives got trained in the areas of Plant Biosecurity.The valedictory session was chaired by Dr. Sagar Hanuman Singh, IPoS (Director General, NIPHM) along with Dr. Alice RP Sujeetha (Director-PB) and Dr. Vidhu Kampurath, Registrar (*i/c*). Plant biosecurity exists within a continuum that can be broken down into three broad areas: pre–border, border and post–border. Biosecurity issues are best dealt with 'pre–border' (offshore) activities such as Pest Free Area, management, inspection and treatment.


Inauguration


Practical Sessions


Cultural programme


Valedictory Session

5. **Sanitary Phytosanitary, Good Agricultural Practices and Food Safety:** Total six APEDA sponsored programmes on export promotion & Good agricultural practices were conducted by NIPHM in Collaboration with KVKs of Bihar (Kaimur, Arrah and Aurangabad) and Uttar Pradesh (Barabanki, Basti & Gorakhpur) respectively on 26th, 28th, 29th December, 2022 and15th, 16th & 17th, February, 2023 to educate the FPOs & Farmers. During the training programmes a total of 360 farmers and FPO's were participated. Awareness was created among the farmers on maintenance of sanitary and phytosanitary measures, Good Agricultural Practices and Food Safety measures to make agriculture produce exportable. During the training program farmers and entrepreneurs asked the queries about the procedures of Good Agricultural Practices and export procedures etc. They were also interested to know about the market access for export of various commodities grown in Bihar and Uttar Pradesh. Farmers were also educated about the process of exporting their potential commodity in the district. Information was also given on reducing the usage of chemicals and relies on biological control of pests and diseases to reduce the chemical application in their respective crops.


भवन
केन्द्र-हैदरगढ़-बाराबंकी-225124
224229


कृषि विज्ञान केन्द्र, बेलीपार, गोरखपुर
कृषि विज्ञान केन्द्र, बेलीपार, गोरखपुर


Awareness Training Programme on


Awareness Training Programme on
"SPS Measures, Good Agriculture Practices and Food Safety"
FOCUS
ENTER


Awareness Training Programme
on
"SPS Measures, Good Agriculture Practices and Food Safety"

बेहतर लाभ के लिए सही तकनीक व योजना से खेती करें किसान

प्रतिनिधि, औरंगाबाद शहर

सिरिस कृषि विज्ञान केंद्र में कृषि और प्रसंस्कृत खाद्य उत्पादों के निर्यात विषय पर प्रशिक्षण शिविर का आयोजन किया गया. एनआईपीएचएम, हैदराबाद, एपीडा, वाराणसी एवं कृषि विज्ञान केंद्र के संयुक्त तत्वावधान में इसका आयोजन हुआ. उद्घाटन डॉ चंद्रशेखर, डॉ विश्वराज, शुभम कुमार, डीएओ रणवीर सिंह, वरीय वैज्ञानिक डॉ नित्यानंद ने संयुक्त रूप से किया. डॉ नित्यानंद ने सर्वप्रथम केंद्र में आये सभी अतिथियों, एफपीओ के सदस्यों एवं किसानों का स्वागत किया. एफपीओ के सदस्यों एवं किसानों से कहा कि कृषि उत्पादन तो कर रहे हैं और समय के साथ इसकी उत्पादकता में भी वृद्धि हो रही है, लेकिन सही मूल्य उन्हें प्राप्त नहीं हो रहे हैं, जिसके कारण उनके द्वारा उत्पादन का शुद्ध लाभ काम प्राप्त हो रहा है. अगर किसान अपने उत्पाद का प्रसंस्कृत करके

कार्यक्रम का उद्घाटन करते पदाधिकारी.

उसके उत्पाद को अन्य देशों में निर्यात करें, तो उन्हें अधिक मूल्यों पर विक्रय कर अधिक लाभ प्राप्त किया जा सकता है. शुभम कुमार ने एपीडा के अंतर्गत निबंधन करने की विधिवत जानकारी देते हुए, उसमें लगने वाले आवश्यक कागजातों के बारे में विस्तृत जानकारी दी. डॉ चंद्रशेखर ने अपने उत्पादों का निर्यात कैसे करे व इसके लिए निबंधन, निबंधन शुल्क, पौध संगरोध की जांच प्रक्रिया व इनके द्वारा किस उत्पादों को कितने समय में प्रमाणित किया जायेगा तथा इसके निर्यात किये जा रहे उत्पाद के मूल्य आदि की विस्तृत जानकारी दी. डॉ विश्वराज ने कृषि उत्पादन करते समय मिट्टी का चयन, प्रजातियों के चयन, सिंचाई के लिए उपयोग किये जा रहे पानी की जांच, अनुशंसित मात्रा में कीटनाशक, फफूंदनाशक आदि दवा का संतुलित मात्रा में प्रयोग, साथ ही दूसरे खेती में इस्तेमाल किये गये कृषि यंत्रों को साफ करके ही दूसरे खेतों में प्रयोग करना आदि विषयों की विस्तृत जानकारी दी. डीएओ ने किसानों से कहा कि सबसे पहले समय को पकड़ने की आवश्यकता है.

साथ समय पर फसलों, सब्जियों की बुआई एवं रोपाई किया जाए तो उनमें रोग वाले किट एवं व्याधि भी कम लगता है तथा उनके मूल्य भी अच्छे प्राप्त होते हैं. साथ ही जब सब्जियों के मूल्य कम हो जाए तो उनके प्रसंस्कृत कर उनके उत्पाद बना करके उन्हें अच्छे मूल्यों पर बेच सकते हैं. इस मौके पर विभिन किसान उत्पादक संगठन के सदस्य, किसान मुकेश मौआर, गुजीकोर मेहता, अभिषेक, अलोक सिंह आदि सहित 83 किसानों ने भाग लिया.

आरा भास्कर

किसानों को मिलेगा लाभ - गुणवत्तायुक्त चावल, सब्जी व फलों के लिए अनुकूल है यहां की भौगोलिकता

जिले में खाद्य उत्पाद के निर्यात की अपार संभावनाएं, किसानों की बढ़ेगी आमदनी

किसानों को निर्यात से संबंधित नियमों की दी गई जानकारी

किसान जैविक विधियों से करें फसल सुरक्षा: डॉ. सत्यराज

भोजपुर से कृषि उत्पादनों के निर्यात की काफी संभावना: डॉ. द्विवेदी

कार्यक्रम में ये रहे मौजूद

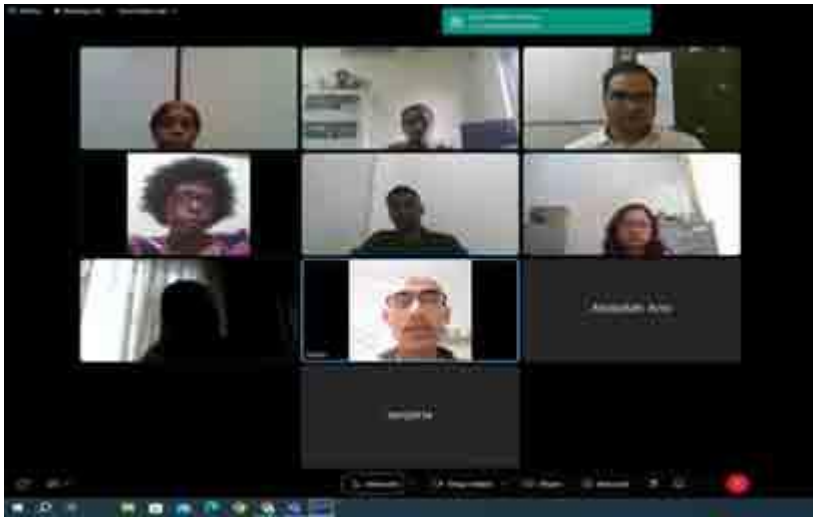
6. **Fumigation as a Phytosanitary Treatment (MBr and ALP Fumigation** :The trade in food grains, seeds, plants for propagation and various wood packaging materials are the primary pathways for global spread of plant pests. Fumigation is one of the approved Phytosanitary treatments to facilitate import and export of agricultural commodities. National Institute of Plant Health Management (NIPHM) is a notified Institute for organizing 15 days training programme on Phytosanitary Treatments (Methyl Bromide and Aluminium Phosphide fumigation).

   As per NSPM 11, 12 & 22, the eligible operators shall be required to undergo the above training for the accreditation of Fumigation Agencies for undertaking Methyl bromide and Aluminium Phosphide Fumigation. Hence, NIPHM has organized this 15-Days training from 27th February- 13th March, 2023 on Methyl bromide and Aluminium Phosphide fumigation. A total 19 participants attended the program from different states of India.

Practical Sessions

Group Photo

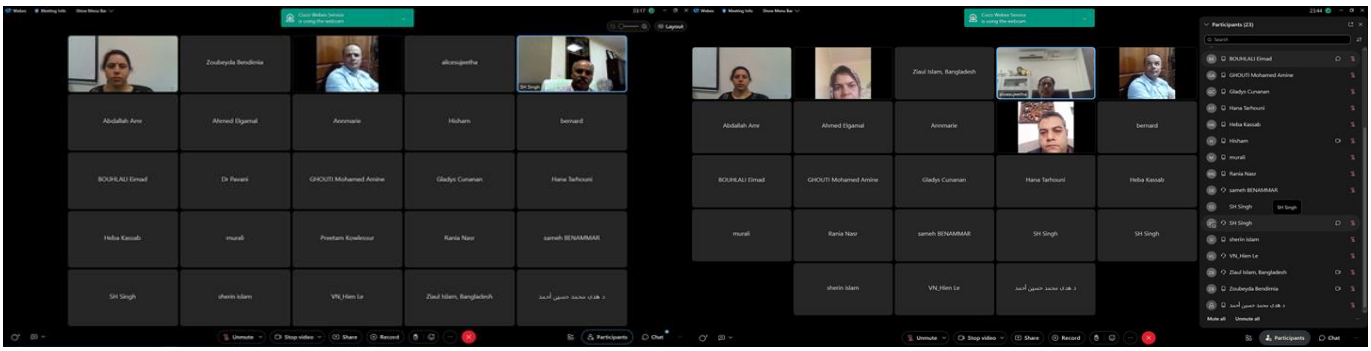
7. ***e*-ITEC MEA programme on Plant Pest Surveillance**: NIPHM in partnership of Indian Technical and Economic Cooperation (ITEC) under the Ministry of External Affairs (MEA), Govt. of India organized an exclusive virtual International training on "Plant Pest Surveillance" from 13th to 17th March, 2023. In this program, ten officers from five countries *viz*., Algeria, Egypt, Jamaica, Morocco and Mauritius got trained in the areas of International Regulation *w.r.t.* Plant Health, Pest Surveillance, ISPM - 6, Specific Surveys, Pest Free Area, Fruit Fly Surveillance and online tools for pest detection and identification.



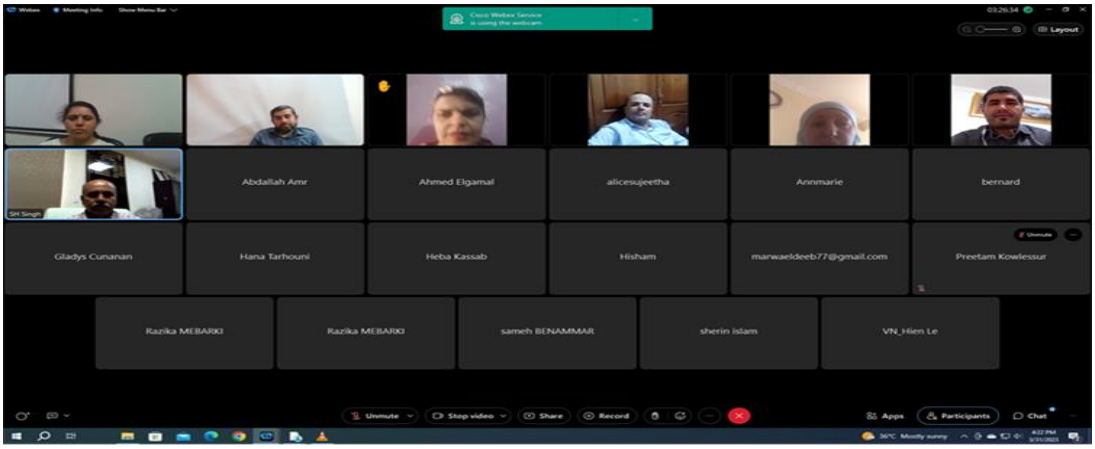
8. ***e*-ITEC MEA programme on Fundamentals of Pest Risk Analysis:** Pest Risk Analysis (PRA) is an early warning tool to safeguard country's agriculture from pests that may be associated with imported agricultural commodities. PRA facilitates evaluation of the likelihood of the entry, establishment, or spread of a plant pest and the associated potential biological and economic consequences. Further, it comes in handy to apply appropriate phytosanitary measures that can reduce the probability of a risk to an acceptable level by the importing country. PRA also assists in identifying the bottle necks to promote pest free exports of commodities and market access for new commodities in international trade.

   The analysis however needs skilled personnel with updated knowledge and resources, and sound understanding of the internationally accepted methodology. To build capacity in this area, NIPHM in partnership with Indian Technical and Economic Cooperation (ITEC) under the Ministry of External Affairs (MEA), Govt. of India has organized an exclusive virtual International training on "Fundamentals of Pest Risk Analysis" from 27th to 31st March, 2023.

   A total of 22 participants from different countries (Algeria-6, Egypt-8, Bangladesh-1, Vietnam-1, Jamaica-1, Tunisia-2, Morocco-1, Mauritius-1 and Philippines-1) were attended the programme. The participants were exposed to International regulatory framework, different steps in PRA & practices with additional emphasis on detailed methodology. The trainees have also actively participated in the group exercises and related assignments.



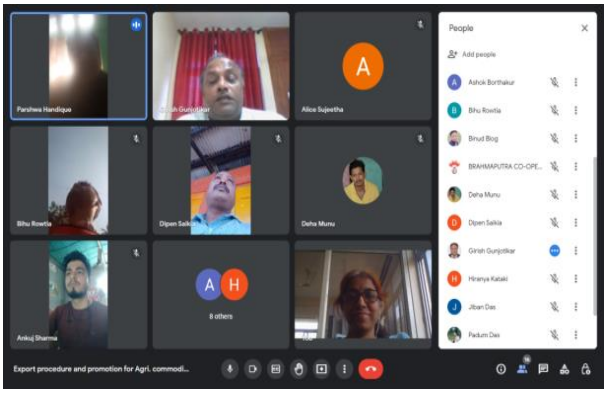
Inauguration



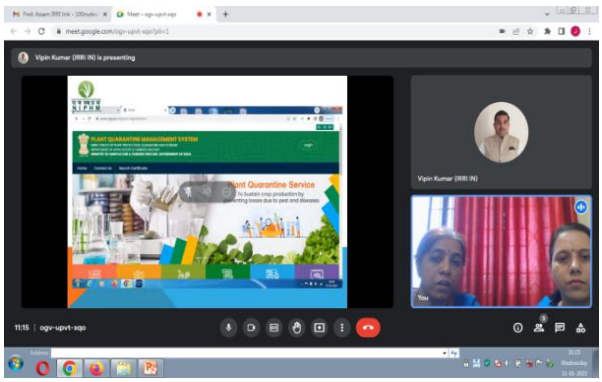
Valedictory

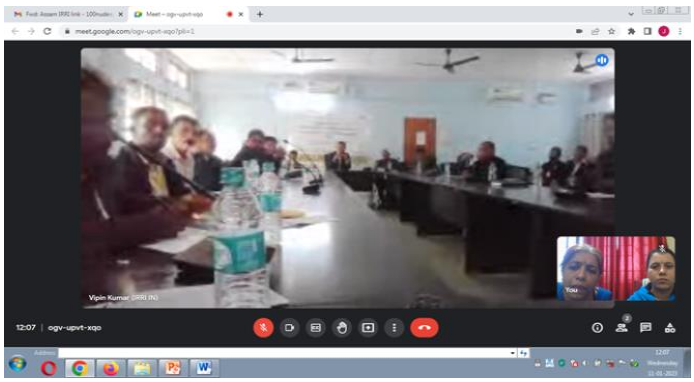
B. FARMERS PROGRAMMES

1. **Export potential and export procedure for agricultural commodities**: One day online programme was organized for FPOs of Nagaon District, Assam state on 10t^{h} January, 2023 and 16 participants have attended the programme.



2. **Plant quarantine procedures for export and import of plants and plant products:** In collaboration with International Rice Research Institute (IRRI), a technical partner in Assam Agribusiness and Rural Transformation Project (APART) two programmes were organized on plant quarantine procedures for export and import of plants and plant products for Assam. The programmes were organized for 50 FPOs of Assam on 11th & 21st January, 2023.





VERTEBRATE PEST MANAGEMENT

3. **Certificate Course on Urban Integrated Pest Management**: The programme was organized for the structural pest management professionals from 1st to 15th February 2023. Total 30 participants were attended the course from various states. The topics covered on ecology and ethology of rodents, mosquitoes, termites, cockroaches, bedbug and flies *etc.* and their management practices. In addition emphasis was also given on other aspects such as safe and judicious use of pesticides, care, handling and maintenance of pesticide application equipment. Food safety & standards in food processing industries, urban weed management, Start-up in Pest control, etc. were also covered during the technical sessions.

4. **Risk assessment of vertebrate Pest Management**: Training to Agricultural Extension officers and scientists of SAUs, ICAR was conducted through virtual mode from 8th to 17th February, 2023. Total 32 officers; AOs/ ADAs/ Scientists from SAUs were trained on various aspects such as major vertebrate pests (Nilgai, wild boar, monkey and birds) in agri and horti cultural ecosystem, and their management. Apart from that biology and morphology of rodents, breeding profile of rodents, rodent borne diseases, non-chemical and chemical management of rodent pest etc. were also taught to the participants.

C. FORTHCOMING PROGRAMMES OF PBD & VPM (APRIL- JUNE, 2022)

Division	Name of the programme	No. of Days	From	To
PBD	Fruit fly: Surveillance and Management	05	10.04.2023	14.04.2023
	Forced Hot Air Treatment (FHAT)	05	17.04.2023	21.04.2023
	Stored Grain pest detection, identification and management	05	24.04.2023	28.04.2023
	Refresher course for fumigation (Aluminium Phosphide and Methyl Bromide)	03	02.05.2023	04.05.2023
	Plant Quarantine Procedures for Import and Export	05	08.05.2023	12.05.2023
	Plant Bio Security & Incursion Management (PBIM)	05	15.05.2023	19.05.2023
	Invasive Alien Species: Introduced and Emerging Pests	03	22.05.2023	24.05.2023
	Orientation for PSC Issuing Authority	05	29.05.2023	02.06.2023
	Pest Risk Analysis	05	05.06.2023	09.06.2023
	Fumigation as a Phytosanitary Treatment (Methyl Bromide and Aluminium Phosphide)	15	12.06.2023	26.06.2023
	Phytosanitary measures for safe export	03	26.06.2023	28.06.2023
VPM	Rodent Pest Management	05	08.05.2023	12.05.2023
	Vertebrate Pest Management – Wild boar, Monkey and Birds	03	06.06.2023	08.06.2023

Plant Health Management Division

Training programmes

The Plant Biosecurity Division has organized following training programmes during the months of **January-March, 2023**.

S No	Name of the programme	No. of Days	From	To
I.	**Officers programme**			
1.	Training of Trainers (TOT) on 'On farm Production of Biocontrol Agents and Microbial Biopesticides' for the officers from Assam	03	03.01.2023	05.01.2023
2.	Production Protocol for Biofertilizers	05	16.01.2023	20.01.2023
3.	Plant Health Management in Horticulture Crops	05	30.01.2023	03.02.2023
4.	Orientation training program on 'Plant Health Management' for newly recruited officials of DPPQ&S (Batch II)	30	19.01.2023	17.02.2023
5.	ITEC – MEA training program on Mass Production and Quality Control of Biopesticides	Two weeks	08.02.2023	21.08.2023
6.	Integrated Soil Nutrient and Rhizophere Management	03	13.02.2023	15.02.2023
7.	Quality control of Microbial Biopesticides	10	22.02.2023	03.03.2023
8.	Role of Biofertilizers and Biocontrol agents in Agriculture	10	20.03.2023	29.03.2023
II.	**Farmers training programme**			
1.	On farm Production of different biocontrol agents	01	03.03.2023	--
2.	Pest and Disease management through biological means	01	03.03.2023	-
3.	Use of EPN for the root grub management in Sugarcane	01	10.03.2023	--
III.	**Webinars/Workshop**			
	Nil			
IV.	**Student training programme**			
1	Plant Health Management for Sustainable Agriculture	21	14.02.2023	06.03.2023
V.	**Certificate course**			
1	Certificate course on PHM in Organic farming(Part-III)	10	01.03.2023	10.03.2023

I. Training programme report (officers)

II. Officers Training Programme Report

1. **Training of Trainers (TOT) on 'On farm Production of Biocontrol Agents and Microbial Biopesticides' for the officers from Assam :** A special on campus 3 days training program on Training of Trainers (TOT) from Assam on "On farm Production of Biocontrol Agents and Microbial Biopesticides" was organized from 3rd to 5th January, 2023 at NIPHM. The programme was funded by World Bank under Assam Agribusiness and Rural Transformation Project (APART) of IRRI. In this training program total 18 officers from APART project Assam working at various KVKs and 2 officers from IRRI including 6 members of Board of Directors of Farmer Producer Companies (FPC).have participated.



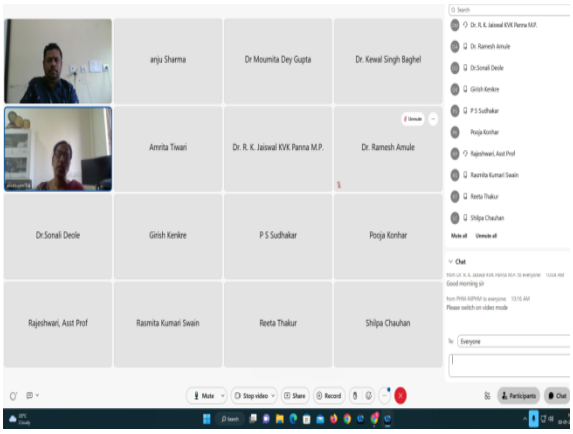


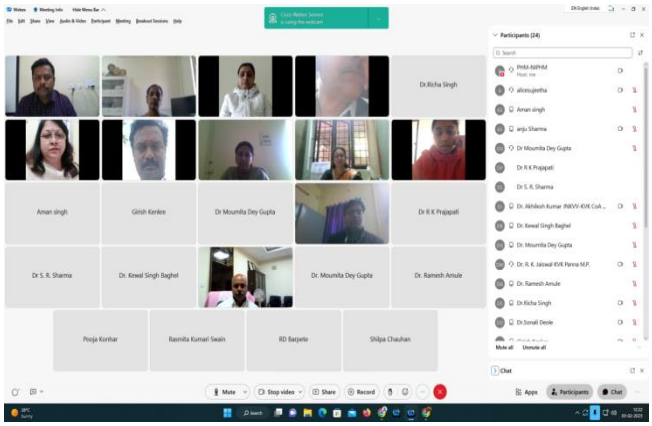
2. **Production Protocol for Biofertilizers:** As scheduled in the NIPHM training calendar 2022-23, an online training programme on '***Production Protocol for Biofertilizers'*** was organized at NIPHM from 16.01.2023 to 20.01.2023 (5 days). In this programme a total of 31 officers from different states & organizations have participated. This training is helpful to the participants in terms of enhancing their knowledge and skill regarding on production, mass production process, quality control and application of biofertilizers. This training covered theory and hands on techniques on role of Biofertilizers in Plant Health Management, protocol for isolation, purification of microbial isolates used in biofertilizer production, mycorrhizae biofertilizer for sustainable Agriculture, preservation of microbial isolates, establishment guidelines for biofertilizers production laboratory, mass production of liquid based Biofertilizers, carrier based biofertilizer production technology, Advances in plant growth promoting rhizobacterial technology, isolation of Mycorrhizae biofertilizers, On-farm production of bacterial Biofertilizers and application methods, On-farm production of Mycorrhizae (VAM) biofertilizer, Quality Control of bacterial Biofertilizers. The particpants have also visited Biofertilizer Laboratory, PJTSAU, Hyderabad and experienced the large scale production process.





3. **Plant Health Management in Horticulture Crops:** The training program on 'Plant Health Management in Horticulture Crops' was conducted from 30.01.2023 to 03.02.2023 (5 days) through online mode. A total of 26 participants from different organizations have attended this program.

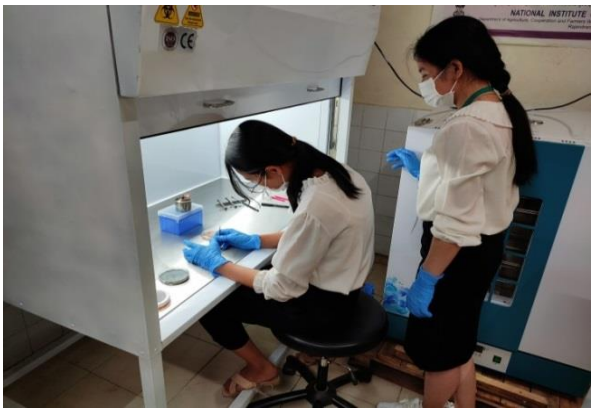


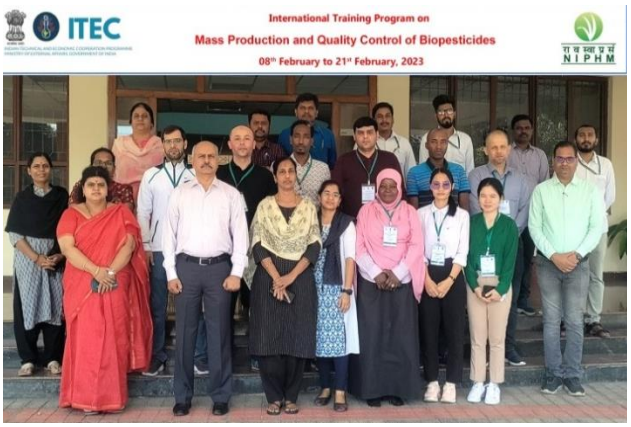


4. **Orientation training program on 'Plant Health Management' for newly recruited officials of DPPQ&S (Batch II):** An Orientation Training Program on 'Plant Health Management' for Newly Recruited Officials of DPPQ&S (Batch II) was conducted from 19.01.2023 to 17.02.2023 (30 days). A total of 25 participants from DPPQ&S working at various Central Integrated Pest Management Centres (CIPMCs) and Plant Quarantine Stations (PQSs) have attended the training program.

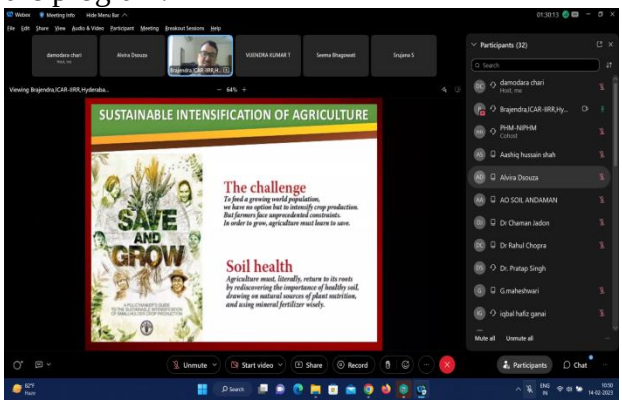
5. **ITEC – MEA training program on Mass Production and Quality Control of Biopesticides:** NIPHM is the training partner with the Indian Technical and Economic Cooperation (ITEC) under the Ministry of External Affairs (MEA), Govt. of India. An international e-ITEC training program on 'Mass Production and Quality Control of Biopesticides' was conducted from 08.02.2023 to 21.02.2023 (2 weeks) for the officials of various countries. The main objective of the training program is to impart knowledge on production and quality control

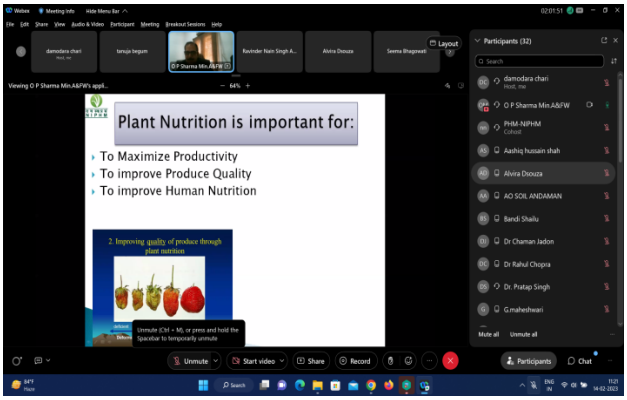
aspects of microbial biopesticides, etc. A total of 09 participants from different countries *viz*., Ethiopia, Sudan, Tanzania, Tajikistan, Cambodia and Iraq have attended the program.





6. **Integrated Soil Nutrient and Rhizophere Management:** As scheduled in the NIPHM training calendar 2022-23, an online training programme on 'Integrated Soil Nutrient & Rhizosphere Management' was organized from 13.02.2023 to 15.02.2023 (3 days). A total of 26 officers from different states & organizations have participated in the program.





7. **Quality Control of Microbial Biopesticides:** As per the NIPHM training calendar 2022-23, a training programme on quality control of microbial biopesticides has been organized from 22.02.2023 to 03.03.2023 (10 days). In this training programme, a total of 09 participants from different organizations have participated.

8. **Role of Biofertilizers and Biocontrol Agents in Agriculture:** A training program on 'Role of Biofertilizers and Biocontrol Agents in Agriculture' has been organized at NIPHM from 20th to 29th March 2023 (10 days). A total of 08 participants from different SAUs, KVKs and Agriculture and allied departments have participated in this training programme.




II. Farmers training programmes

1. **On farm Production of different biocontrol agents:** As a part of National Science Day observance on 03-03-2023, an on-campus training program was conducted at NIPHM in collaboration with PJTSAU, Hyderabad. In this training program, 20 farmers from Siricilla districts of Telangana State along with 3 staff of PJTSAU have participated.

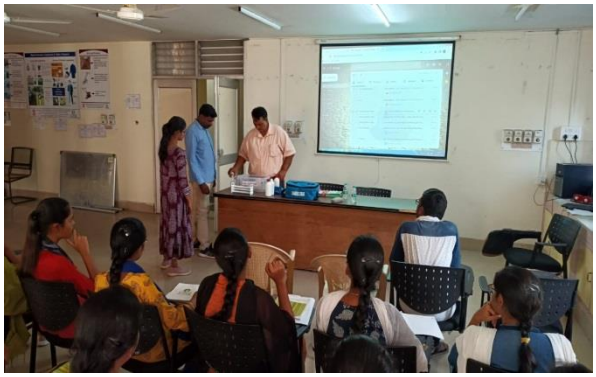

2. **Pest and disease mmanagement through biological means:** A farmers training programme on 'Pest and Disease management through biological means' was organized on 03.03.2023. In this programme, 20 farmers from Maharashtra State have participated and learnt about different biocontrol measures.

3. **Use of EPN for the root grub management in Sugarcane:** One day farmers training programme on 'Use of EPN for the root grub management in Sugarcane' was organized on 10th March 2023. The programme was at NIPHM and attended 20 farmers from Telangana.

III. Student Training Programme:

1. **Plant health management for sustainable agriculture:** As per the request from Acharya N.G.Ranga Agricultural University (ANGARU) under Institutional Development Plan (world bank NAHEP project), a 21 days special training program on **'Plant Health Management for Sustainable Agriculture'** for students was organized at NIPHM from 14.02.2023 to 06.03.2023. In this program total of 30 B.Sc.(Ag) second year students from different campuses of ANGRAU have participated.



IV. Eductional programme

1. **Certificate Course on PHM in Organic Farming:** A three months course on Certificate Course on Plant Health Management in Organic Farming has been conducted at NIPHM. The programme was techanically supported by **ICAR- Indian Institute of Farming System Research, Modupuram (UP). In this programmed t**otal 21 participants from AP and Telangana States have enrolled. Most of the participants are graduates with science background and few are practicing organic growers/ entrepreneurs.

   Course Progression:
   Part-I. On-Campus 21 days (01.12.2022 to 21.12.2022): During the part I of the course, both theory and practical aspects of plant health management in organic farming are covered including topic related organic produce certification, marketing and entrepreneurial skill. Arranged 3 field exposure visits where farmers / organizations are practicing organic farming. Worked out and finalized project works to be carried out during Part II of the course.

   Part-II (On-field experience and application): In this part, field activities were undertaken by the participants and performed as on-farm practice based project work. The design of project work was facilitated by the ICAR-IIFSR faculty from 26.12.2022 to 23.02.2023 (60 days) at the respective locations/ regions of the participants.

   Part-III (on-campus): This part of the course for 10 days was organized at NIPHM, Hyderabad. In this part, problems faced during field activity were discussed with experts and shared with others. The participants were facilitated to understand the problems faced during their field experience/ exposure. The participants have carried out the project work and submitted project report on assigned tasks for evaluation (01.03.2023 to 10.03.2023).

Forthcoming training programmes

S No	Name of the programme	No. of Days	From	To
I.	**Officers training programmes**			
1.	On-farm Production of Bio-inputs	10	12.04.2023	21.04.2023
2.	Orientation training program to newly recruited DPPQs officers on Plant Health Management	30	20.04.2023	19.05.2023
3.	Field Diagnosis and Management of Plant Parasitic Nematodes	05	08.05.2023	12.05.2023
4.	Good Agricultural Practices (GAP)	05	15.05.2023	19.05.2023
5.	Training on organic and natural farming practices	05	22.05.2023	26.05.2023
6.	Plant Health Management in Protected cultivation	05	05.06.2023	09.06.2023
7.	Production Protocol for Bio-fertilizers	05	12.06.2023	16.06.2023
8.	Integrated Soil Nutrient and Rhizosphere management	05	19.06.2023	23.06.2023
9.	Quarantine Nematodes of Economic importance	03	26.06.2023	28.06.2023
II.	**Farmers training programmes**			
1.	On farm production of bio control agents	03	10.04.2023	12.04.2023
2.	On farm production of bio control agents	03	29.05.2023	31.05.2023
3.	On farm production of bio control agents	03	12.06.2023	14.06.2023

Pesticide Management Division

Training Programme:

A. During January to March, 2023, the division has conducted SIX offline scheduled training programme.

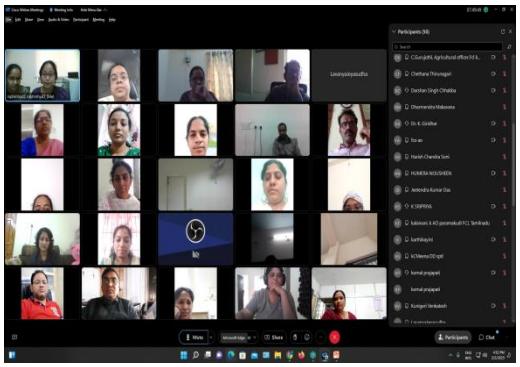
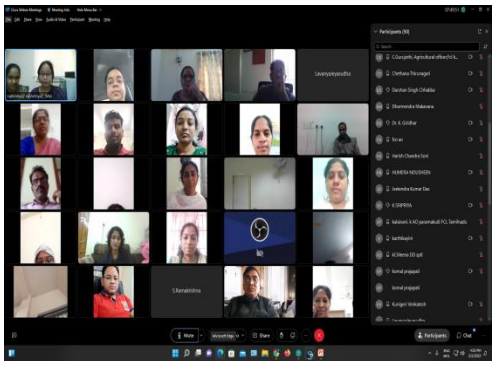
Sl. No.	Name of the programme	No. of Days	From	To
1.	Laboratory Quality Management System and Internal Audit as per ISO/IEC 17025:2017	5	16.01.2023	20.01.2023
2.	Pesticide Formulation Analysis	60	23.01.2023	23.03.2023
3.	Role of PT and ILC in maintaining accreditation as per the ISO/IEC17025:2017	1	02.02.2023	
4.	Documentation Procedure for NABL Accreditation	4	14.02.2023	17.02.2023
5.	Laboratory Quality Management and Internal Audit as per the ISO/IEC17025:2017	5	13.03.2023	17.03.2023

1. **Laboratory Quality Management System and Internal Audit as per ISO/IEC 17025:2017:** Pesticide Management Division has conducted 5 days training programme on **"Laboratory Quality Management System and Internal Audit as per ISO/IEC 17025:2017**" from 16.01.2023 to 20.01.2023. A total of 36 officials/Analysts from various State Agriculture Department of Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu, and Telangana including 5 participants from Pvt. Ltd., Maharashtra were attended the training. The officials/Analysts were trained on general requirement for the competence of testing and calibration laboratories in accordance with **ISO/IEC 17025:2017.** The trainees were also trained on process of Internal Audit.

2. **Pesticide Formulation Analysis**: Pesticide Management Division has conducted 60 days training programme on **"Pesticide Formulation Analysis**" from 23.01.2023 to 23.03.2023. A total of 23 officials/Analysts from State Agriculture Department of Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Punjab, Tamil Nadu and Uttar Pradesh were attended the training. The officials/Analysts were trained on various Techniques/ procedures such as volumetric, spectroscopic and chromatographic for analysis of pesticide. The trainees were visited to pesticide formulation Laboratory (ADAMA Pvt. Ltd.) as a part of training programme.




3. **Role of PT and ILC in maintaining accreditation as per the ISO/IEC17025:2017:** Pesticide Management Division has conducted one day training programme on **"Role of PT and ILC in maintaining accreditation as per the ISO/IEC17025:2017" on 02.02.2023** through online mode. A total of 51 officials/Analysts from State Agriculture Department of Andhra Pradesh, Bihar, Gujarat, Maharashtra, Rajasthan, Tamil Nadu, and Telangana were attended the training. The officials/Analysts were trained on importance and role of Proficiency Testing and Inter-laboratory comparison programme in maintaining accreditation of testing laboratories in accordance with **ISO/IEC 17025:2017.**

4. **Documentation Procedure for NABL Accreditation:** Pesticide Management Division has conducted 4 days training programme on **"Documentation Procedures for NABL Accreditation**" from 14.02.2023 to 17.02.2023. A total of 19 officials/Analysts from State Agriculture Department of Tamil Nadu and Odisha were attended the training. The officials/Analysts were trained on various documentation procedures requirement for the competence of testing laboratories in accordance with **ISO/IEC 17025:2017.**



5. **Laboratory Quality Management and Internal Audit as per the ISO/IEC17025:2017:** Pesticide Management Division has conducted 5 days training programme on **"Laboratory Quality Management system and Internal Audit as per the ISO/IEC17025:2017" from 13.03.2023 to 17.03.2023**. A total of 40 officials/Analysts from State Agriculture Department of Andhra Pradesh, Bihar, Gujarat, Maharashtra, Rajasthan, Tamil Nadu, and Telangana including 23 trainees of Pesticide formulation Analysis were attended the training. The officials/Analysts were trained on general requirement for the competence of testing and calibration laboratories in accordance with **ISO/IEC 17025:2017.** The trainees were also trained on process of Internal Audit and maintenance of accreditation of testing laboratories in accordance with **ISO/IEC 17025:2017.**


Farmers Programs:

Sl. No.	Name of the programme	No. of Days	From	To
1.	Safe handling and disposal of pesticides and pesticide containers (Raipally Mandal)	Forenoon	07.03.2023	
2.	Safe handling and disposal of pesticides and pesticide containers (Atmakur Mandal)	Afternoon	07.03.2023	
3.	Safe handling and Safe disposal of Pesticide Containers, Mundrai village, Nangunuru Mandal, Siddipet Dist	1	28.03.2023	
4.	Safe handling and Safe disposal of Pesticide Containers, Lingampally Village, Bachannapet Mandal., Jangam Dist	1	29.03.2023	

1. **Safe handling and disposal of pesticides and pesticide containers:** Pesticide Management Division has conducted a training programme for farmer on **"Safe handling and disposal of pesticides and pesticide container" at Raipally village, Nalgonda District, Telangana on 07.03.2023 (Forenoon)**. A total of 20 farmers were attended the programme. Pesticide management such as pesticide uses, storage, transport, handling and disposal of pesticides is very important to minimize adverse health and environmental effects. Hence, the division has given training to the farmers on importance of safe handling of pesticide during and after uses with a view to prevent risk to human being and animals. The division has also trained on proper disposal of pesticide and pesticide containers for the safety of human being and environment.

2. **Safe handling and disposal of pesticides and pesticide containers:** Pesticide Management Division conducted training programme for farmer on **"Safe handling and disposal of pesticides and pesticide container" at Atmakur Mandal, Nalgonda District, Telangana on 07.03.2023 (Afternoon)**. A total of 16 farmers were attended the programme. The division has given training to the farmers on importance of safe handling of pesticide during and after uses, proper disposal of pesticide and pesticide containers for the safety of human being and environment.

Forthcoming training programmes:

Sl. No.	Title of the Programme	Duration	From	To	Eligibility Criteria
1.	Inspection and Sampling of pesticides under Insecticides Act, 1968 (ISPP) through ONLINE MODE	3	10.04.2023	12.04.2023	Agricultural / Horticultural Officer (or equivalent position) working in State Department (or) designated Insecticide Inspector (Central/State)
2.	Role of PT and ILC in Quality Assurance and maintaining accreditation as per the ISO 17025:2017 through ONLINE MODE	1	17.05.2023		Analysts/Scientists working in Govt. Labs / Universities
3.	Laboratory Quality Management System and Internal Audit as per ISO/IEC 17025:2017	5	19.06.2023	23.06.2023	Analysts working in Government Laboratories

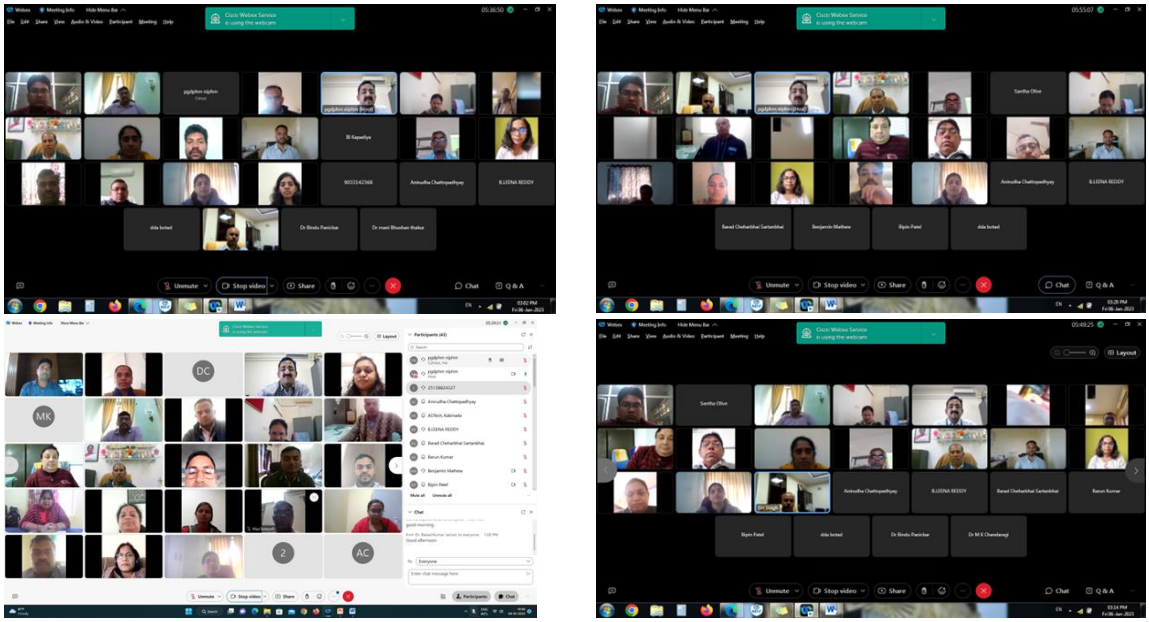
Plant Health Engineering Division

The Plant Health Engineering Division has organized following training programmes during the months of **January-March, 2023**.

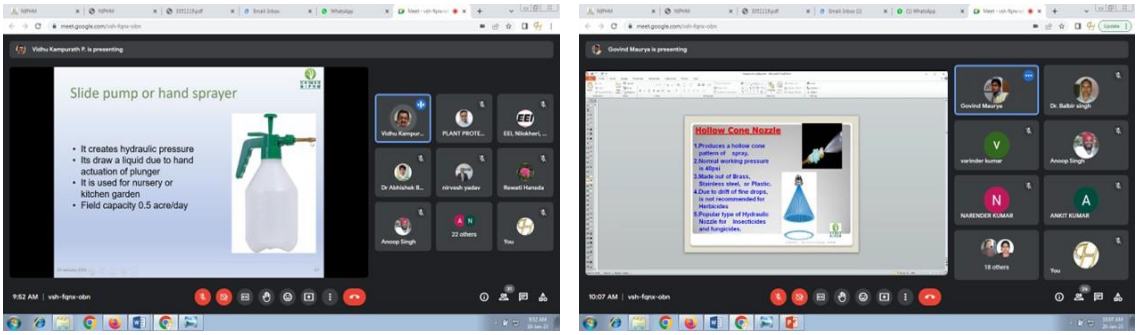
S No	Category	Name of the programme	No. of Days	From	To
1.	Officers	Pesticide Application Techniques and Safety Measures	05	02.01.2023	06.01.2023
2.	Officers	Extension strategies for Application of Pesticide Techniques and Safety Measures	03	18.01.2023	20.01.2023
3.	Officers	Digital agriculture	03	23.01.2023	25.01.2023
4.	Officers	*Pesticide Application Techniques and Safety Measures	03	23.01.2023	25.01.2023

5.	Officers	Exposure visit cum demonstration for officers on advanced plant protection techniques	01	03.02.2023	03.02.2023
6.	Officers	Post Harvest Management and Storage Techniques	05	20.03.2023	24.03.2023
7.	Officers/Students/ Profesionals	Webinar on Synergising Drone Applications in Agriculture	01	25.03.2023	25.03.2023
8.	Farmers	Micro-Irrigation	01	27.10.2022	27.10.2022
9.	Farmers	Pesticide Application Techniques and Safety Measures	01	08.02.2023	08.02.2023
10.	Farmers	Post-Harvest Management for different crops produce	01	08.02.2023	08.02.2023
11.	Farmers	Pesticide application Techniques and Safety Measures	01	28.03.2023	28.03.2023
12.	Farmers	Pesticide application Techniques and Safety Measures	01	28.03.2023	28.03.2023
13.	Farmers	Pesticide application Techniques and Safety Measures	01	29.03.2023	29.03.2023
14.	Farmers	Pesticide application Techniques and Safety Measures	01	29.03.2023	29.03.2023

1. **Pesticide application Techniques and Safety Measures:** A 5 day virtual training programme on "Pesticide Application Techniques and Safety Measures" was organized from 2nd to 6th January 2023. Total 44 officers 28 male and 16 female participants from 9 states from A.P, Bihar, Chhattisgarh, Gujarat, Karnataka, Kerala, Tamil Nadu, Orissa and Uttarakhand participated in the training programme. The participants were enriched with Principles of pesticide application techniques, different spraying techniques, selection of sprayer, nozzles and its classification, calibration of sprayers and nozzles, pesticide formulations and compatibility, safety precautions and minor maintenance of pesticide application techniques and drone spraying. Pre and post evaluation along with assignments on various sessions were given to assess the knowledge transfer. Good appreciation and positive beedbacks was received from the participants.

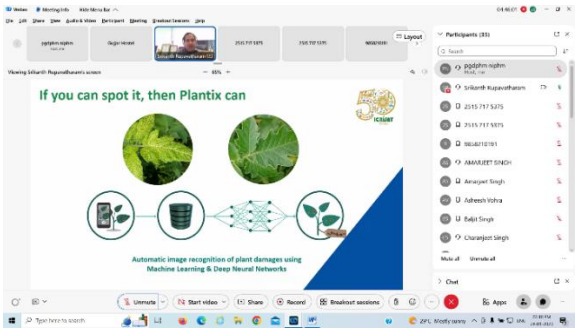


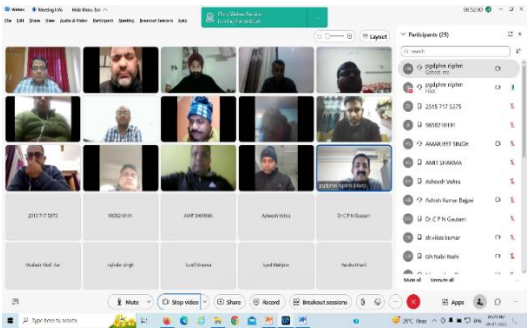
2. **Extension strategies for Application of Pesticide Techniques and Safety Measures:** Plant health engineering division conducted an online 3 days training programme on "Application of Pesticide Techniques and Safety Measures" in collaboration with EEI, Nilokeri, Haryana from 18.01.2023 to 20.01.2023. Total 34 officers (Male – 28, Female – 6) had successfully completed the training programme. The participants were from 5 different states Haryana, Jammu & Kashmir, Punjab, Uttarakhand, Uttara Pradesh. The participants were trained on different aspects such as principles of pesticide application techniques, extension methods to facilitate farming community about pesticide safety, hazards and risks, Pesticide poisoning and safety measures during application of pesticides, Nozzles and calibration, Insects – pests of field crops and their management strategies, Efficient spraying techniques for plant health, Safety measures while handling of pesticides, Farmers field school- an efficient extension method for reduction of pesticide use in field crops.



3. **Digital Agriculture:** An online program on Digital Agriculture was conducted by the division from 23-01-2023 to 25-01-2023 which was attended by a total of 46 officers (male: 39 and female: 7) from various organizations across the country. The lectures covered topics related to basics of ICT, GIS, GPS, Big Data, IoT, Precision Agriculture, Plantix App, Smart Precision Models for Agriculture, Sensor based Agriculture, Decision Support Systems and their uses with use case examples on each technology in agriculture, aspects of enabling use of ICT by smallholder farmers, field state wise agriculture tools and uses, various sources of agriculture related information and digital tools available, types of ICT-enabled services useful for enhancing livelihoods of smallholder farmers, key drivers of ICT in agriculture. Innovative business models and partnerships, designing an ideal ICT solution for various needs, various principles of digital development, importance of feasibility studies,

Requirements Analysis with focus on agriculture applications, the SDLC process, various software development process etc.

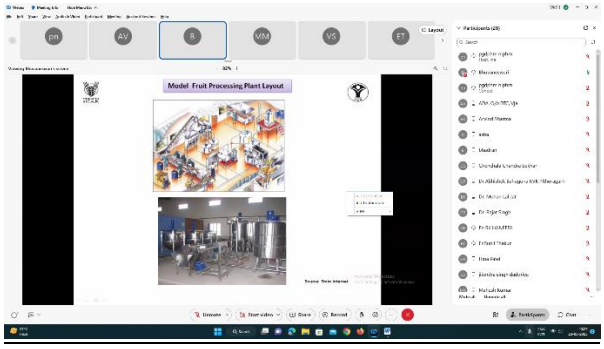


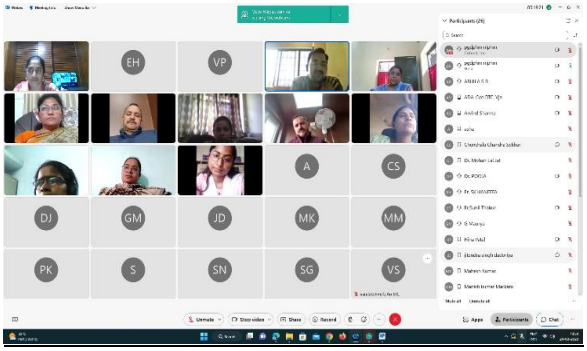


4. **Exposure visit cum demonstration for officers on advanced plant protection techniques (Officers);** Plant Health Engineering division organized an exposure visit in coordination with Extension Education Institute, Hyderabad on advanced plant protection techniques on 3rd February 2023. The participants were briefed on techniques like electrostatic spraying, drone spraying etc. Demonstration was organized on different techniques. Detailed explanation given on various sprayers and queries were attended.

5. **Post Harvest Management and Storage Techniques:** Total 29 officers, 16 male and 13 female participants attended the 5-day programme, conducted during 20th to 24th March 2023. Lectures were arranged on topic viz., Post-harvest losses of Agricultural commodity, Post-harvest losses of fruits and vegetables, Cleaning and grading of agricultural commodities, fruits and vegetables, Drying and storage for

Agricultural commodity, Drying and dehydration for fruits and vegetables, Storage and transportation facilities for fruits and vegetables, Import and export facilities for agricultural commodities, Packing methods and material, Machineries used for processing and Alternative processing methods and Rodent pest management in storage and Value from waste in horticulture. Pre and post evaluation along with assignments on various sessions were given to assess the knowledge transfer. Good appreciation received from the participants.





6. **Pesticide Application Techniques and Safety Measures:** Plant Health Engineering division conducted 3 days on campus training for Bihar State Agriculture Management Extension Training Institute (BAMETI) officials on "Pesticide application techniques and safety measures" from 23.01.2023 to 25.01.2023. Total 21 male participants from Bihar attended the training programme. The participants were trained on different aspects such as Adverse impacts of pesticide spraying case studies, principles of pesticide application techniques, spraying techniques, Pesticide formulation and compatibility, Nozzles types and its importance, theoretical calibration of sprayers, safety precautions while handling of pesticides, Care and maintenance of sprayers and filed practical on High volume manual and power sprayers, Low volume and ultra-low volume sprayers demonstration of tractor operated orchard and boom sprayers, Demonstration of advance sprayers such as electro static and drone sprayers, filed calibration of sprayers, Practical on maintenance of sprayers and measurement of droplets.


Farmers Programs:

1. **Pesticide Application Techniques and Safety Measures** (**Farmers**); PHE division conducted an off-campus training programme on "Pesticide Application Techniques and Safety Measures" at Rampur village, Nangnoor mandal, Siddipet, Telangana on 8th February 2023. Mr. Raju, Despande Foundation helped in mobilizing the famers for this training program. Er. M Udaya Bhanu (Scientific Officer) organized this training programme for twenty three farmers at Rampur village. The different spraying techniques high volume, low volume and ultra low volume, classification of sprayers, selection of sprayer based on crops and type of pesticide use was explained in detail using the display cards. The farmers were also briefed about the types of nozzles and the importance in selecting a nozzle. They were also explained how to calibrate a nozzle and sprayer for efficient application of chemical on the target areas. A practical demonstration of various patterns with different types of nozzles and selection of nozzle was explained in detail. The importance of safety precautions while handling chemicals was demonstrated with the help of one farmer and the disposal of containers was explained. The Dos' and Don'ts while handling chemicals was also explained.




2. **Post-Harvest Management for different crops (Farmers):** PHE division conducted an off-campus training programme on "Post-Harvest Management for different crops" at Kondamrajpally village, Nanganur Mandal, Siddepet district, Telangana on 8th February 2023. Deshpande foundation and Better Cotton Initiative mobilized the farmers in the village. The main crops grown in the village are Paddy, Maize, Cotton, Vegetables and leafy vegetables.

   The session started with a brief introduction about the NIPHM. The different divisional activities are explained. Also explained importance of Institute role in mobilizing farmers through training.

   In the session, the farmers are explained about postharvest losses in agriculture, harvesting and winnowing tools and methods. Traditional drying methods like sun drying, dos and don'ts and CAP storage has also discussed. In this different small and marginal and woman friendly post-harvest machinery available was explained and farmers are also shown interest to know different types of dryers available for different crops.

   Low cost storage structures like Zero energy cool chamber was explained and discussed how the storage life of vegetables and leafy vegetables extended during ZECC storage and comparative studies with room and refrigerator storage explained to farmers during training programme.

   Farmers felt very happy to know the different on-farm storage facilities available and actively the involved during the secession.

3. **Pesticide application Techniques and Safety Measures – total 4 programmes at four locations of Siddipet, Jangaon and Hanumakonda Districts of Telangana**

   PHE division conducted an four off-campus training programme on "Pesticide Application Techniques and Safety Measures" in collaboration with Better Cotton Initiative (BCI). The programme was on payment basis to educate the farmers on ill effects of non-judicious application of pesticides and to make them aware on the safety aspects and care to be taken while spraying. Practical demonstration and on-field experiences were included for better understanding and awareness. The programmes were arranged at four different locations as detailed below, on 28th and 29th March 2023. The training programme was moduled to cover the aspects of adverse impacts of spraying, basic spraying principles, selection of a

sprayer, and selection of nozzle and safety precautions. The demonstration of different spray patterns with nozzles and its selection was also explained during the programme.

- Pangidipalli Village, Kamalapur Mandal, Hanumakonda district – 28th March
- Mundrai Village, Nanganur Mandal, Siddipet District – 28th March
- Lingampally Village, Bachhanna peta Mandal, Janagaon District – 29th March
- Arepally Village, Rayapol Mandal, Siddipet District – 29th March

Each batch was formed with 25/26 participants. Hence total 103 farmers were trained during the programme.

ఆంధ్రప్రభ

పురుగు మందుల పిచికారిపై శిక్షణ

ఆరేపల్లిలో రైతులకు అవగాహన కల్పిస్తున్న దృశ్యం

రాయపోల్, మార్చి 29(ప్రభన్యూస్) రాయపోల్ మండలం పెద్ద ఆరెపల్లి గ్రామంలో బుధవారం బిసిఐ ఆధ్వర్యంలో (నేషనల్ ఇన్స్టిట్యూట్ ప్లాంట్ హెల్త్ మేనేజ్మెంట్) ఆధ్వర్యంలో రైతులకు పురుగు మందుల పిచికారి, పనిముట్లు మరియు వ్యక్తిగత భద్రత పైన రైతులకు శిక్షణ ఇవ్వడం జరిగింది. ఈ కార్యక్రమంలో దేశ్ పాండే ఫౌండేషన్ ప్రోగ్రాం మేనేజర్ దినేష్ రెడ్డి, గజ్వేల్ పి యు మేనేజర్ రాజేష్, గోవింద కుమార్, మోరియా, ఉదయభాను మాధవి, అక్షర, అభిమాన్యు, కోఆర్డినేటర్ భాస్కర్, రైతులు తదితరులు పాల్గొన్నారు.

Date: 30/03/2023, Edition: Medak, Page: 15
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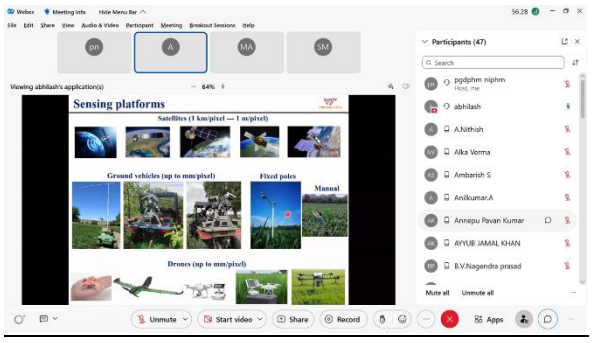
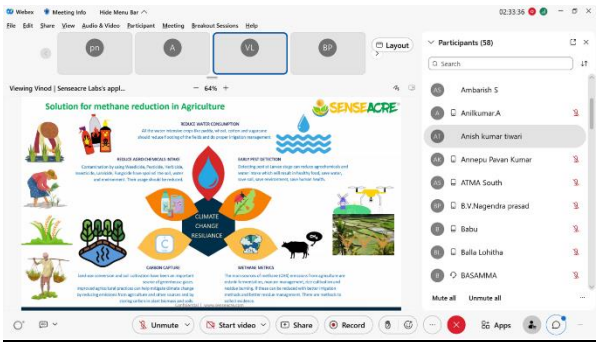
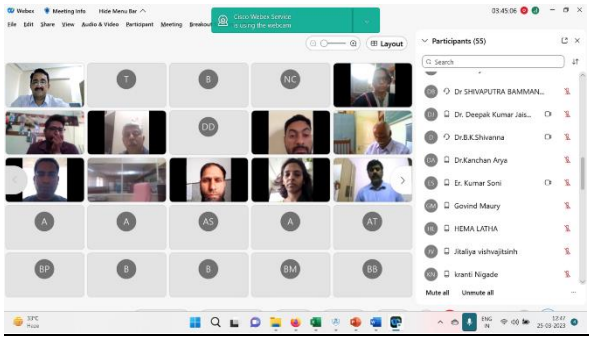
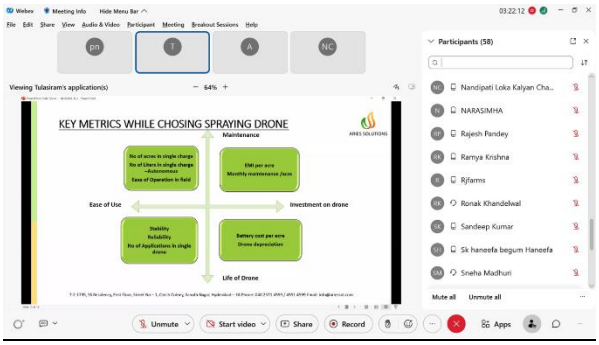
Webinars / Seminars:

1. **Webinar on Synergising Drone Applications in Agriculture:** A national webinar on Synergising drone application in agriculture was conducted on 25th March 2023. The drone usage in agriculture for spraying, pest detection and diagnostics, mapping and monitoring etc. were emphasized. Both academic and industry perspectives were covered in four lectures delivered by the experts. Dr. Abhilash Chandel, Asst. Prof. of Biological Systems Engineering, Virginia Tech, VA, USA, Mr. Vinod Kumar S, Founder & Director M/s Senseacre Labs Pvt. Ltd, Mr. Prem Kumar, Founder, M/s Marut Drones and Mr. Tulasi Ram, Director, M/s Aries Solutions were the experts. The participants were benefitted with field experiences shared by the experts and good deliberation witnessed in the session. About 54 participants actively experienced the sessions.









Educational Programs:

PGDPHM/DPHM:

- PGDPHM students midterm theory and practical examination conducted and paper evaluation completed. First Seminars also completed.
- Students of PGDPHM visited ICRISAT as part of their course work.
- PGDPHM students final theory and practical examination conducted.

Forthcoming training programmes

S.No	Title of the Programme	Division	From	To	Eligibility criteria	Course Coordinator & e-mail
1.	Farm equipment for plant health management (Collaborative)	**PHE**	**02.05.2023**	**04.05.2023**	Extension officers from State Agriculture and Horticulture departments, Scientists of ICAR, SAUs and officials from KVKs, DPPQs	Dr. Vidhu Kampurath Joint Director (PHE) jdenggniphm-ap@nic.in
2.	RS & GIS applications in Plant Health Management	**PHE**	**23.01.2023**	**25.01.2023**	Extension officers from State Dept. of Agri./ Horti., soil survey, soil conservation, Watershed Project, Scientists of ICAR/ SAUs , etc. working on GIS	Er. M. Udaya Bhanu Scientific Officer (PHE) sopheniphm2-ap@nic.in
3.	Pesticide application techniques and safety measures	**PHE**	**19.06.2023**	**23.06.2023**	Extension officers from State Agriculture and Horticulture departments, Scientists of ICAR, SAUs and officials from KVKs, DPPQs	Er. Haneefa Begum Assistant Scientific Officer (PHE) asopheniphm2-ap@nic.in
4.	Pesticide application techniques and safety measures	**PHE**	**24.04.2023**	**24.04.2023**	Farmers	Er. Haneefa Begum Assistant Scientific Officer (PHE) asopheniphm2-ap@nic.in
5.	Pesticide Application Techniques and Safety Measures (Skill development programme)	**PHE**	**29.05.2023**	**02.06.2023**	Graduate students with agriculture background	Dr. Vidhu Kampurath Joint Director (PHE) jdenggniphm-ap@nic.in
6.	Micro-irrigation	**PHE**	**09.06.2023**	**09.06.2023**	Farmers	Er. Govind Maurya Assistant Scientific Officer (PHE) asopheniphm1-ap@nic.in

Research & Development

- **AICRP on Biological Control of Crop Pests (ICAR-AICRP-BC)-NIPHM, Hyderabad (**Volunteer Centre)

  Evaluation of NIPHM white media for the production of *Nomuraea rileyi (Metarhizium rileyi)* NIPHM MRF-1 strain for management of Maize Fall Army worm (*Spodoptera frugiperda*)

  The project aimed for the evaluation of *Metarhizium rileyi* production using two media viz. NIPHM White media and broken rice media. To standardize the production technology, the media under test were made into six treatments (Broken rice (without yeast extract), Broken rice (with yeast extract), 1% NIPHM white media, 2% NIPHM white media, 3% NIPHM white media, 4% NIPHM white media with two replications for each treatment.

  Project progress during this quarter: Preparation of SMAY media and Performed sub culturing of Metarhizium rileyi (EPF) on SMAY media. The work on bioassay is under progress.

- **Pesticide Formulation and Residue Analytical Centre (PFRAC):**

  The Pesticide Formulation and Residue Analytical Centre (PFRAC), Pesticide Management Division, is an accreditated laboratory in accordance to ISO/IEC 17025:2017. During the period the laboratory has collected 270 samples (Fruits, vegetables, cereals, pulses, milk and water) from Banjarahill Hyderabad, Medchal/Malkajigiri and Saidabad under Central Sector Scheme "Monitoring of Pesticide Residues at National Level (MPRNL). The samples were analyzed for pesticide residues by LC-MS/MS and GC-MS/MS.

  A total of 185 samples (fruit and vegetables) were received from ANGRAU and samples were analyzed under MPRNL scheme. The Laboratory also received 105 water samples from CSIR-NEERI for pesticide residues analysis by LC-MS/MS under MPRNL scheme. All the samples were analyzed. The division has also received 54 tobacco samples from Tobacco Board, Guntur. All the samples were analyzed.

  A total of 85 botanical/bio-pesticides samples were received from Tamil Nadu, Bihar, Kerala, Gujarat, Karnataka and Maharashtra. The samples were analyzed by GC-MS/MS and LC-MS/MS.

  Eighteen pesticides formulation samples were received from National Seed Corporation, Raichur, Karnataka and Bhopal for quality test. Six pesticides formulation samples were received from FCI, Madhya Pradesh. All the samples were analyzed.

- **Proficiency Testing Center (PTC):**

  Proficiency testing programme on Pesticide Residues Analysis (PT-PRA)

  PTC, PMD has organized PT PRA programme on Brijal (PTC/PR/04/22-23) in the month of December 2022. The samples were dispatched on 13th Dec, 2022 after homogeneity study to 25 MPRNL laboratories/participants and 2 private laboratories/participants. Stability studies for PT-PRA Brinjal samples were initiated. Statistical evaluation ("Z" Score) of participants results of Brinjal (Acetamiprid, Bifenthrin, Carbofuran & 3-hydroxy carbofuran, Chlorpyrifos, Deltamethrin, Lambda Cyhalothrin, Monocrotophos and Thiacloprid) for 28 participants were evaluated. Interim reports of PT-Brinjal were sent to 28 participants after statistical evaluation.

  PT PRA Programme for Central Pollution Control Board (CPCB): Trail study of pesticide residues analysis in water sample was conducted for PT-PRA - CPCB programme (Central Pollution Control Board).

- **Proficiency testing programme on Pesticide Formulation Analysis (PT-PFA)**

  PTC, PMD conducted PT PFA programme on Acetamiprid Technical (PTC/PF/04/2022-23), Deltamethrin EC (PTC/PF/05/2022-23) and Atrazine WP (PTC/PF/06/2022-23) in the month of November 2022. Samples were dispatched to 54 laboratories including two Private laboratories. Stability studies for Acetamiprid Technical, Deltamethrin EC, Atrazine WP samples were conducted. The interim reports of Acetamiprid Technical, Deltamethrin EC and Atrazine WP were sent to 54 participants after statistical evaluation (Z-Score) of participants result.

Extension Activities / Village Adoptions

- **Farmer Advisory Cell Activities:** Under farmers advisory cell, faculty have interacted with farmers about their queries related to plant protection, bioinputs usage, etc. Around 450 farmers have approached NIPHM through telephonic communication and provided advisory on various aspects of plant health.

Other Activities

- **Rodent and Household Pest Management MOOCs Certificate Course:** Advertisement placed on NIPHM Website.
- **MOOCs in Plant Biosecurity**: Advertisement placed on NIPHM Website.
- **KERALA PGDPHM:** Students are engaged in their project work.
- **Lab Activities:**
  - Maintaining/Rearing of stored grain insect cultures viz. *Tribolium*, Rice weevil, Khapra, Pulse beetle, Cigarette beetle, Saw toothed grain beetle and Rice moth.
  - Fruit fly lure preparation
  - Urban pest insect box preparation
  - Maintenance of vermicompost unit
  - Disease specimen- Herbarium collection
  - Maintenance of vermicompost unit at NIPHM and staff quarters
- AD (RPM) delivered a guest lecture on Prophylactic and curative treatments for stored grain pest management at IGMRI, Hyderabad.
- ASO (VPM) delivered a guest lecture on Vertebrate Pest Management in Storage Godowns for the officials of FCI, SWC officials. The programme was organized by IGMRI, Hyderabad.
- ASO (VPM) delivered a talk on "Vermicompost for the Sustainable Agriculture" in an International conference on Frontiers in Biological Science (ICFBS-2023) organized by JKK Nataraja College of Arts and Science, Kumarapalayam, Tamil Nadu.

- A meeting was arranged with Indian Pest Control Association (IPCA) team to structure skill development courses on urban pest management and fumigation.


- Faculty attended the election duties in Biennial Election to the Legislative Council.
- Officers are involved in organizing "Certificate Course for Insecticide dealers/ distributors.
- Visits of students, trainees from other institutes and farmers were taken care by the nominated faculty of the division.
- **NIPHM Instructional Farm:** During this quarter 2022-23, sowing of cucurbits (ridge gourd, bottle gourd, bitter gourd), maize, groundnut, onion, paddy, tomato, etc was done. Perforemed cultural practices with special emphasis on IPM for insect pest management, installation of pheromone traps and sticky traps, data collected, etc. Fields were monitored regularly and carried out data recording on pests and natural enemies, biodiversity.
- **Protected Cultivation in Polyhouse:** During this quarter, activities cultivation of cabbage, cauliflower, broccoli and Kheera were carried out. Installed pheromone traps and sticky traps. Collected and destroyed leaf eating caterpillars to avoid further infestation.
- Based on the invitation received a talk on Drone applications in Agriculture was handled by Dr. Vidhu Kampurath P, Joint Director at Farm Mech-Farm Machinery Demonstration Mela 2023, organized by Kerala Agricultural University on 13th February 2023.


- Er. M. Udaya Bhanu, SO(PHE) and Er. Sk Haneefa Begum, ASO(PHE) attended Drone Remote pilot training at Pune Maharashtra from 13.03.2023 to 15.03.2023.
- Er. Govind Kumar Maurya attended the webinar on Water Management in Action for Productive, Climate Resilient Food Systems organized by IWMI
- Dr. Vidhu Kampurath P attended the Board of Studies meeting as an expert member for the B Sc Ag programme of VFSTR Deemed to be University.

- Dr. Vidhu Kampurath P, chaired a session and presented a keynote lecture on Assessment of pesticide spraying awareness for optimal efficiency and reduced exposure hazards in the Global Conference on Climate Smart Agriculture, organized by VFSTR Deemed to University in association with ICRISAT, APAARI, CIFOR, PPAI, Dr.YSRHU, SKLTSHU and PJTSAU.
- Forty input dealers of DAESI programme under CSPS at HRS Konda Mallepalli visited PHE workshop, and got acquainted with Sprayers and nozzles and tractor operated sprayers.


- Twenty-five farmers from Siricilla along with two faculty from Agricultue college, Siricilla visited PHE workshop and got acquainted with different NIPHM developed equipment.


राजभाषा

राजभाषा कार्यान्वयन समिति की चतुर्थ बैठक एवं अन्य गतिविधियां संपन्न

राजभाषा कार्यान्यवन समिति **(राकास)** की चतुर्थ बैठक वर्ष 2022-23 हेतु दिनांक 20-04-2023 को श्रीमती स्पूर्थि रेड्डी, आई.एस.आर. रजिस्ट्रार, एनआईपीएचएम की अध्यक्षता में आयोजित हुई। बैठक में रजिस्ट्रार के समक्ष जनवरी-मार्च,202 3 की तिमाही हिंदी प्रगति रिपोर्ट प्रस्तुत की गई। उन्होंने उक्त रिपोर्ट की समीक्षा करते हुए संस्थान में राजभाषा अधिनियम की धारा (3)3के पूर्णतअनुपालन किये जाने के निदेश दिये :। एनआईपीएचएम के सभी प्रौद्योगिकी वीडियो या किसानों से संबंधित अन्य प्रौद्योगिकी वीडियो एवं अन्य दिशानिर्देशों का भी हिंदी में अनुवाद - किया जाए।यह भी निदेश दिये कि एनआईपीएचएम के अधिकारियों एवं कर्मचारियों के लिए त्रैमासिक कार्यशाला के (2023-अप्रैल से जून) ऐसे क दौरान हिंदी वृत्तचित्र फिल्म दिखाने का आयोजन किया जाए एवं ार्यक्रम भी किया जाए जिनमें कर्मचारी हिंदी में बोले भाग ले सके।/

संस्थान की गतिविधियां :-

हिंदी कार्यशाला :

दिनांक 2023-03-01को राष्ट्रीय वनस्पति स्वास्थ्य प्रबंधन संस्थान में डॉसागर हनुमान सिंह .,भासे.डा., महानिदेशक एनआईपीएचएम की-क्षता में अधिकारियों एवं कर्मचारियों के लिए एक दिवसीय हिंदी कार्यशाला का आयोजन किया गयाअध्य। महानिदेशक ने अधिकारियों एवं कर्मचारियों को संबोधित करते हुए कहा कि हमारा संस्थान एक केन्द्रीय प्रशिक्षण संस्थान है। हम सभी का यह संवैधानिक एवं नैतिक जिम्मेदारी बनती है कि हम अधिक से अधिक कार्यालयीन कामकाज हिंदी में करें। इस प्रकार की कार्यशाला के माध्यम से अधिकारी एवं कर्मचारी हिंदी में कार्यसाधक ज्ञान प्राप्त कर सकते हैं तथा राजभाषा हिंदी में कार्य कर सकते हैं। उन्होंने आगे कहा कि उपस्थित कर्मचारी इस कार्यशाला का भरपूर लाभ उठाएं एवं अपने दैनिक सरकारी कामकाज में इसका उपयोग अवश्य करें।

इस कार्यशाला में आमंत्रित अतिथि वक्ता श्री संतोष कुमार, सहायक निदेशक, (टंकणराजभाषा (, केंद्रीय हिंदी प्रशिक्षण उपसंस्थान ने - अधिकारियों एवं कर मचारियों को यूनिकोड के माध्यम से हिंदी में कार्य करने की जानकारी दी तथा दैनिक कार्यालय कामकाज के दौरान कंप्यूटर पर ध्वन्यात्मक टंकण) वॉइस टाइपिंग (के बारे में बताया। साथ ही उन्होंने कंप्यूटर पर वॉइस टाइपिंग कैसे की जाती है और इसके उपयोग के बारे में महत्वपूर्ण जानकारी दी।

उन्होंने कुछ महत्वपूर्ण सुझाव भी दिए जैसे प्रशासन एवं लेखा अनुभाग तथा वैज्ञानिक क्षेत्र के अधिकारियों एवं कर्मचारियों के लिए उनके कार्य क्षेत्र में तकनीकी एवं व्यवहारिक शब्दों से संबंधित जानकारी दी तथा राजभाषा हिंदी में कार्य करने में जो कठिनाईयां आ रही है, उन कठिनाईयों का समाधान भी किया।

इस समारोह में संस्थान के वरिष्ठ अधिकारी डॉएलिस आर पी सुजीता .जे ., निदेशक (पीबीडी), डॉपी.विधु कम्पूरत ., संयुक्त निदेशक (पीएचई), डॉनिर्माली सा .ईकीया (पीएमडी), डॉ. एम जयादेवी, उप निदेशक (रसायन), श्री एन मुरली मोहन, डॉ. एजीगिरीश ., उपनिदेशक (पीपी)एवं अन्य कर्मचारीगण उपस्थित थे। कार्यक्रम के अंत में हिंदी अधिकारी ने अधिकारीगण, अतिथि वक्ता एवं अधिकारियों एवं कर्मचारियों का आभार व्यक्त किया एवं संस्थान के हिंदी अनुवादक श्री राठौड़ मोहन एवं श्री उबैद मोहम्मद, हिंदी टंकक ने कार्यक्रम के संचालन में सहयोग दिया।

(एनआईपीएचएम में 'हिंदी कार्यशाला' का आयोजन)

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